UNIVERSITY OF MARYLAND / COLLEGE PARK, MARYLAND 20742

UNIVERSITY OF MARYLAND AT COLLEGE PARK

CONSOLIDATED UNDERGRADUATE CATALOG

1971-72

MARYLAND
UNIVERSITY OF MARYLAND
COLLEGE PARK, MD.

UNIVERSITY OF MARYLAND
AT COLLEGE PARK
UNDERGRADUATE
CONSOLIDATED CATALOG
1971-72

THE UNIVERSITY OF MARYLAND BULLETIN is published: once in August; three times in September; two times in October; once in November; seven times in December; three times in January; once in February; once in March; two times in April; four times in May; two times in June; and three times in July. Published thirty times. Re-entered as second class mail matter under the Act of Congress on August 24, 1912, and second class postage paid at College Park, Maryland 20742.

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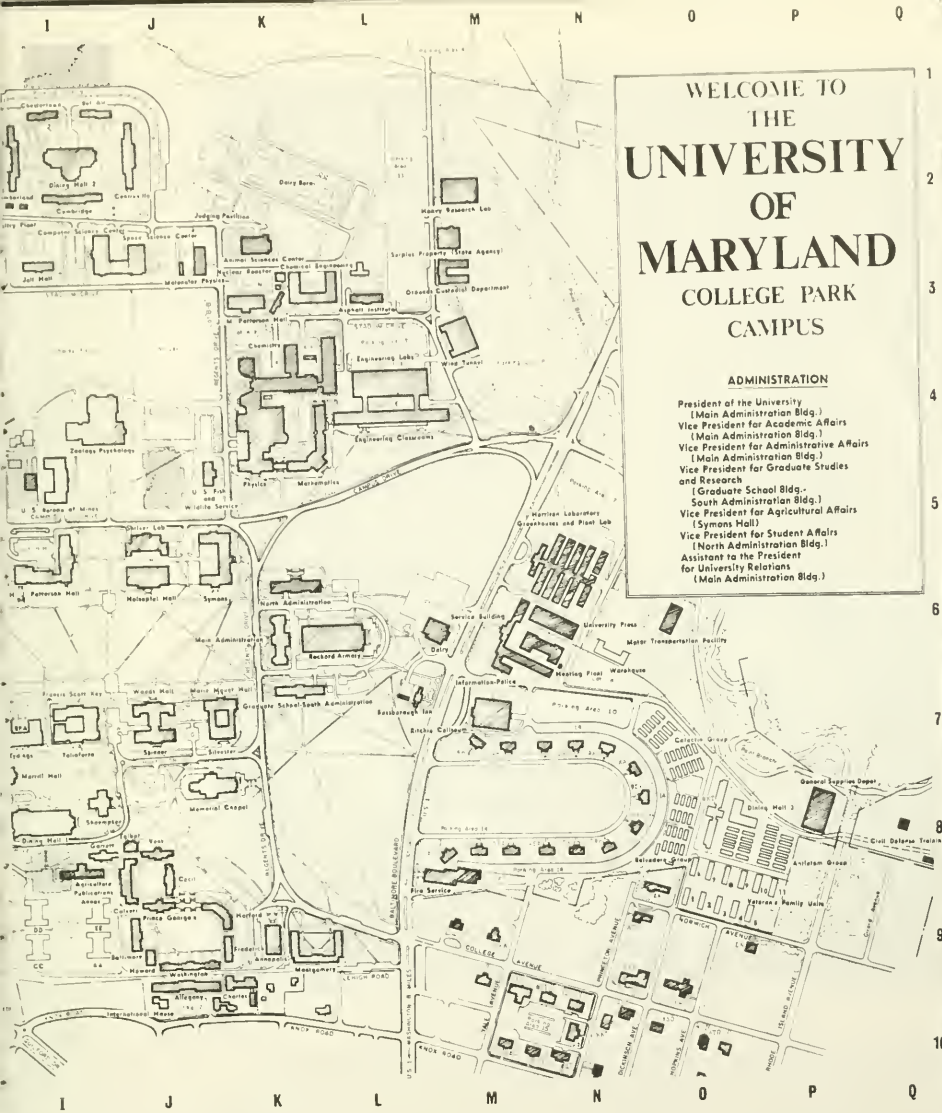

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PARKING

Casual visitors, without permits, may park in those parking wells adjacent to major buildings which are clearly marked for visitors. Metered parking is also available around the Student Union and in parking areas L (Administration Buildings), DD Computer and Space Sciences Centers) and in areas KK and T (Engineering - Sciences Complex). Visitors participating in University sponsored special activities may through special arrangement with the Campus Police, be assigned temporary parking places

This publication is a consolidation of information on eight individual undergraduate schools and colleges at the University's College Park campus. It also incorporates information governing University facilities, services and student life contained in the Student Guide, *University General and Academic Regulations.*

Copies of the *Undergraduate Consolidated Catalog* will be distributed free of charge to all students at the time of their first admission to the University. Those persons requesting copies prior to admission may secure them from the Catalog Mailing Office at $1.50 each. On the campus, copies may be purchased at the Student Supply Store for the same amount. Copies are also available for examination in high schools, public libraries, colleges, junior colleges, and in the schools and colleges of the University.

Photography: Bill Clark, inside front cover; pp. v, vi, 14, 36, 60, 72, 105, 106, 113, 237, 238, 280, 313, 332, 351, 352. Bill Speisman, pp: 8, 118, 204. Lary Crouse, p. 314.

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The University of Maryland stands firmly at the intellectual, political and economic crossroads of the twentieth century. Located in the shadow of the Nation's capitol, the university provides exciting opportunities to study the forces that give life to our society.

Our objective is to open minds so that they may discover new worlds. Here, you will encounter diverse discipines, personalities and opinions. It is our hope that in this challengng environment you will acquire a creative academic spirit.

The knowledge of mankind is available to you. Avail yourself of it.

C. E. Bishop

Chancellor, College Park

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The provisions of this publication are not to be regarded as an irrevocable contract between the student and the University of Maryland. Changes are effected from time to time in the general regulations and in the academic requirements. There are established procdures for making changes, procedures which protect the institution's integrity and the individual student's interest and welfare. A curriculum or graduation requirement, when altered, is not made retroactive unless the alteration is to the student's advantage and can be accommodated within the span of years normally required for graduation. When the actions of a student are judged by competent authority, using established procedure, to be detrimental to the interests of the University community, that person may be required to withdraw from the University.

The University of Maryland, in all its branches and divisions, subscribes to a policy of equal educational and employment opportunity for people of every race, creed, ethnic origin, or sex.

The University of Maryland has been elected to membership in the Association of American Universities. This Association founded in 1900 is an organization of those universities in the United States and Canada generally considered to be preeminent in the fields of graduate and professional study and research.

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CALENDAR FOR THE ACADEMIC YEARS 1971-73

FALL SEMESTER 1971

1971	September 7-11	Tuesday through Saturday	Fall Semester Registration
	September 13	Monday	*Instruction begins*
	November 24	Wednesday, after last class	Thanksgiving recess begins
	November 29	Monday, 8:00 A.M.	Thanksgiving recess ends
	December 17	Friday, after last class	Christmas recess begins
1972	January 3	Monday, 8:00 A.M.	Christmas recess ends
	January 11	Tuesday, after last class	*Instruction ends*
	January 12, 19	Wednesdays	Exam study days
	January 13-21	Thursday through Friday	Fall semester final exams

SPRING SEMESTER 1972

January 31-February 5	Monday through Saturday	Spring Semester Registration
February 7	Monday	*Instruction begins*
March 31	Friday, after last class	Spring recess begins
April 10	Monday, 8:00 A.M.	Spring recess ends
May 23	Tuesday, after last class	*Instruction ends*
May 24	Wednesday	Pre-exam study day
May 29	Monday	Memorial day
May 25-June 2	Thursday through Friday	Spring semester examinations

FALL SEMESTER 1972

1972	August 26	Saturday	Registration*
	August 28-September 1	Monday-Friday	Registration*
	August 30	Wednesday	*Classes begin*
	November 21	Tuesday, after last class	Thanksgiving recess begins
	November 27	Monday—8:00 A.M.	End of Thanksgiving recess
	December 12	Tuesday	*Last day of classes*
	December 13, 17	Wednesday, Sunday	Exam study days
	December 14-21	Thursday-Thursday	Fall semester examination period

SPRING SEMESTER 1973

1973	January 13	Saturday	Registration*
	January 15-19	Monday-Friday	Registration*
	January 17	Wednesday	*Classes begin*
	March 9	Friday, after last class	Spring recess begins
	March 19	Monday—8:00 A.M.	End of spring recess
	May 8	Tuesday	*Last day of classes*
	May 9, 13	Wednesday, Sunday	Exam study days
	May 10-17	Thursday-Thursday	Spring semester examination period

*Under anticipated new procedures this registration period will be used for drop-adds and special problems.

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General Information

THE UNIVERSITY

The contemporary university is a comprehensive educational institution composed of colleges and schools and offering a multiplicity of undergraduate programs that are closely related to the graduate and professional programs.

Comprehensive universities as we know them in the United States have existed for not more than a century, but their roots can be traced back to medieval history. The English college system served as the model for the earliest American efforts at higher education. The ancient German university tradition was joined with this in the 1870's to form the basic outlines of our present institutions. Practical studies were grafted onto these more classically and theoretically oriented traditions by the agricultural emphasis of the land grant movement.

With the explosion of scientific and technological knowledge in the early twentieth century, the role of the universities in American society attained increased importance, and today almost all aspects of national life—social, economic, scientific, and cultural—benefit from their educational, research and service functions.

OBJECTIVES OF THE UNIVERSITY

Although the University of Maryland is a state institution quite large in physical plant, student enrollment, number of curricula offered, and services performed, its objectives can be simply stated as follows: (1) to prepare students in the arts, the humanities, the basic and applied sciences, and the professional curricula; (2) to provide general education in its broadest sense, both formal and informal, for all students who enroll; (3) to develop those ideals and fine relationships among students which characterize cultured individuals; (4) to conduct systematic research and to promote creative scholarship; and (5) to offer special, continuation, and extension education in communities where it is feasible to do so.

HISTORY

The University had its beginnings in 1807 with the establishment in Baltimore of the College of Medicine, an entirely faculty-owned institution granting the M.D. degree. When, five years later, its name was changed to the University of Maryland, it was given power to confer additional degrees. Subsequently, the University opened a School of Dentistry, the first such school in the world, and then added Schools of Pharmacy, Law, and Nursing.

The College Park campus of the University was opened in 1859 as the Maryland Agricultural College under a charter secured in 1856 by a group of Maryland planters. After a disastrous fire in 1912, the State acquired control of the College and bore the cost of rebuilding. In 1920 the State took over the faculty-owned University in Baltimore, merging it with the State-owned instiution at College Park to form the present-day University of Maryland.

In 1886 the Delaware Conference Academy was

founded by the Methodist Church in Princess Anne, Maryland. Title to the institution was acquired by the State of Maryland in 1926, and it became a division of the University of Maryland in 1948. It was made an integral part of the University system with the name, University of Maryland Eastern Shore (UMES) in 1970.

A new undergraduate branch campus known as University of Maryland Baltimore County (UMBC), was opened at Catonsville in 1966.

THE UNIVERSITY TODAY

The University of Maryland is a comprehensive educational unit offering curricula in over 120 fields. These curricula are offered through the following major academic divisions:

At College Park
- College of Agriculture
- College of Arts and Sciences
- College of Business and Public Administration
- College of Education
- College of Engineering, the Glenn L. Martin Institute of Technology
- College of Home Economics
- College of Physical Education, Recreation, and Health
- Graduate School
- School of Library and Information Services (Graduate level only)
- Summer School
- School of Architecture
- School of Nursing (First two years)
- School of Pharmacy (First two years)

At Baltimore City
- School of Dentistry
- School of Law
- School of Medicine
- School of Nursing
- School of Pharmacy
- School of Social Work and Community Planning

At Catonsville
- University of Maryland Baltimore County

At Princess Anne
- University of Maryland Eastern Shore

Through University College
- Center of Adult Education
- Division of Conference and Institutes
- College Park Evening Division
- Baltimore Division
- Off-Campus Division
- European Division
- Altantic Division
- Far East Division

Other resources of the University include a library system, the Computer Science Center, the Agricultural Experiment Station, the University Hospital, the Psychiatric Institute, the Natural Resources Institute, and various other institutes and bureaus.

UNDERGRADUATE DEGREE PROGRAMS

One major advantage of attending a university is the broad range of programs available. This diversity allows the student to change from one major to another without leaving the institution, to choose from a wide spectrum of elective courses, and to benefit from daily contact with students of diverse academic interests and backgrounds.

The undergraduate majors available at College Park are as follows:

College of Agriculture—B.S. Degrees in:
- General Agriculture
- Agricultural Chemistry
- Agricultural Economics (General, Agricultural Business, International Agriculture, Agribusiness Teaching)
- Agricultural and Extension Education
- Agricultural Engineering
- Agronomy (Crops; Technical Crops; General Crops and Turf Management; Technical Soils; General Soils, Soil Conservation; and Crops, Soils, and Geology)
- Animal Science (Large Animal, Dairying, Poultry, and Animal Science Business)
- Botany
- Conservation and Resource Development
- Entomology
- Food Science
- Geology
- Horticulture (Pomology and Olericulture, Floriculture and Ornamental Horticulture, and Horticultural Education)

College of Arts and Sciences
- American Studies—B.A.
- Anthropology—B.A.
- Art—B.A. (General, Art History, and Studio)
- Astronomy—B.S.
- Biochemistry—B.S.
- Botany—B.A.
- Chemistry—B.S.
- Comparative Literature—B.A.
- Dance—B.A.
- Economics—B.A.
- English—B.A.
- Foreign Languages and Literature—B.A. (Language and Area Studies in French, German, Russian, and Spanish)
- General Biological Sciences—B.S.
- General Physical Sciences—B.S.
- Geography—B.A.
- Government and Politics—B.A.
- History—B.A.
- Latin—B.A.
- Law Enforcement—B.A.
- Mathematics—B.S.
- Microbiology—B.S.
- Music—B.Mus., B.A. (B.Mus. in Theory and Composition, History and Literature, and Applied Music)
- Philosophy—B.A.
- Physics—B.S.
- Psychology—B.S., B.A.
- Russian Area Studies—B.A.
- Sociology—B.A.
- Speech and Dramatic Art—B.A. (General, Dramatic Art, Radio and Television, and Speech and Hearing)
- Zoology—B.S.

College of Business and Public Administration—B.S. Degrees in:
- Business Administration (General, Accounting, Finance, Marketing Personnel and Industrial Relations, Production Management, Management Science—Statistics, Transportation, and Combined Business Administration and Law.
- Economics
- Geography (Urban, Physical, and Cultural Geography and Cartography)

Government and Politics (General, International Affairs, and Public Administration)
Journalism
Information Systems Management

College of Education
Education (includes several non-departmentalized degree programs, both undergraduate and graduate) —B.S., B.A.
Agricultural and Extension Education—B.S.
Early Childhood and Elementary Education—B.S., B.A. (Physical Education, Music, Art, and Foreign Languages)
Industrial Education—B.S.
Library Science Education—B.A.
Secondary Education—B.S., B.A. [Art, English, Foreign Languages (classical or modern), Home Economics, Mathematics, Music (instrumental or vocal), Physical Education, Science, Social Studies (history or geography), Speech, General Business, Secretarial, and Distributive]
Special Education—B.S.
Education for Industry—B.S.
Vocational-Industrial Education—B.S.

College of Engineering—B.S. Degree in:
Aerospace Engineering
Agricultural Engineering
Chemical Engineering
Civil Engineering
Electrical Engineering
Engineering (Undesigned)
Fire Protection
Mechanical Engineering

College of Home Economics—B.S. Degrees in:
Family and Community Development (Family Studies, Community Studies, and Management and Consumer)
Food, Nutrition, and Institution Administration (Food and Nutrition, Experimental Foods, Nutrition; Institutional Administration; and Dietetics)
Textiles and Clothing (Textiles and Apparel, Textile Science, or Textile Marketing)
Housing and Applied Design (Advertising Design, Costume, Crafts, Housing, and Interior Design)
Home Economics Education

College of Physical Education, Recreation and Health—B.S. Degrees in:
Physical Education
Recreation
Health Education

School of Architecture—B.Arch. Degree

University College:
General Studies—B.A.
Military Science—B.S. (No new enrollments accepted)

SPECIAL PROGRAMS

There are certain subjects which the student can choose as a minor or certificate program. These include:

Afro-American Studies (Certificate Program)
Chinese (Minor)
Hebrew (Minor)
Greek (Minor)
Italian (Minor
Computer Science (Minor)
Linguistics (Minor)

Students wishing to pursue programs in social work should consider transfer to UMBC after their first year.

AIR FORCE ROTC

The Department of Air Science operates the Air Force Reserve Officers Training Corps program on an elective basis. The program provides college men with an opportunity to earn commissions in the United States Air Force while earning their degrees. The Air Force ROTC mission is to commission, through a college program, career-oriented second lieutenants in response to Air Force requirements. Students should contact their college within the University to determine the number of AFROTC credits that may be applied toward their degree requirements.

TWO PROGRAMS OFFERED

Four-Year Program

A General Military Course (GMC) is normally for freshmen and sophomores. Those who successfully complete the GMC may apply for the Professional Officer Course (POC) which is the final two years of AFROTC. Progression into the POC is not automatic but is limited to selected students only. Students in the four-year program must attend four weeks of field training at a designated Air Force base during the summer after completing the junior year of college. To enter the AFROTC program, one should inform his advisor and register for it in the same manner as for other courses. Only students who elect the four-year program are eligible to apply for the AFROTC College Scholarship Program.

Two-Year Program

The Professional Officer Course (POC) is normally offered in the junior and senior years, but may be taken by graduate students otherwise qualified. This program is especially attractive for those unable to take the four-year program, particularly transfer students. Evaluation of candidates is normally begun during the first semester of the sophomore year, since each student must meet physical and mental standards set by the Air Force. Interested students should contact a professor of air science as early in their sophomore year as possible. Students in the two-year program must attend six weeks of field training at a designed Air Force base during the summer preceding initial entry into the two-year academic portion. The academic program for the last two years (POC) is identical with the final two years of the four-year program. Cadets in the POC are exempt from the draft, since they are enlisted in the Air Force Reserve. This entitles them to all privileges afforded to military reservists.

UNDERGRADUATE ADMISSION

The University of Maryland, in all its branches and divisions, subscribes to a policy of equal educational opportunity for people of all races, creeds and ethnic origins.

FRESHMAN ADMISSION

Maryland Residents

Admission from secondary school is based on evidence indicating the applicant's probable suc-

cess in the program of his choice. Applicants will be evaluated by two sets of criteria: (1) high school academic record in college preparatory subjects and class standing and (2) the University's predictive index.

High School Record and Class Standing

Applicants for admission from secondary school who have (1) achieved at least a C average (when D is the lowest passing grade) in college preparatory subjects and (2) rank in the top half of their class will be offered admission.

Predictive Index

Applicants who have achieved at least a C average but who do not rank in the upper half of their class will be evaluated on the basis of the University's predictive index. The variables included in the index are the applicant's (1) grade-point average in academic courses, (2) class rank, and (3) Scholastic Aptitude Test scores.

An applicant whose predicted grade-point average at the end of his first year at the University is 1.75 or better will be offered admission.

Other Requirements for Admission

In addition to meeting one of the sets of criteria noted above all applicants must also:

1. Be recommended for admission by their high school principal or counselor;
2. Have received their high school diploma before their first registration with the University;
3. Have successfully completed the high school subjects required for the college and curriculum for which application is made.
   (Note: Admission to the School of Architecture is competitive with selection based on previous academic achievement.);
4. Have completed the Scholastic Aptitude Test and have requested that the results be submitted to the University. Applicants should take the SAT before the end of the fall semester preceding enrollment at the University. For further information on the SAT, applicants should consult their high school counselor or write to the Educational Testing Service, Princeton, New Jersey 08540. To have the test results sent to the University of Maryland at College Park, use the College Park Campus code number, 5814, in the proper place on the test.

Early Decision

Applicants who have a B average in college preparatory subjects during their junior year in high school or who are in the top fourth of their respective classes may be offered an early decision on admission. Once the applicant accepts the offer by remitting the fifty dollar enrollment deposit, he only needs to submit a final transcript documenting graduation from high school to complete the requirements for admission.

The Out-of-State Student

As the state university, the University of Maryland must give preference to residents. The University will offer admission, however, to a limited number of nonresidents of proven academic ability for whom particular programs of the University are especially relevant.

The limitations on out-of-state applicants apply both to freshmen and transfer students.

TRANSFER STUDENT ADMISSION

An applicant must be in good standing in scholarship and character to be considered for admission. Transfer applicants who are residents of Maryland are required to have at least a C average (2.0 on a 4.0 scale) in all previous work or the Associate of Arts degree. Maryland residents who are not admissible as high school seniors must complete 24 credit hours at another institution with a C average before being admitted to the University.

Nonresident applicants are required to have a minimum cumulative average of at least 2.5 on a 4.0 scale.

For further information contact the Coordinator of Transfer Students, Office of Admissions.

Transfer Credit

Advanced standing is assigned to transfer students from accredited institutions prior to registration. Academic courses carrying a grade of C or higher usually are transferable provided they are applicable to the curriculum into which the student is transferring.

Transfer of Credit from Community Colleges

A maximum of sixty (60) academic credits are transferable from community colleges. In general, courses taken at a community college which are equivalent to junior or senior level courses at the University may not be transferred.

Special Problem

Transfer foreign language credit is usually acceptable in meeting college requirements. Prospective students should consult college catalogs to determine the specific requirements of various colleges and curricula.

Credit by Examination. Transfer credit will not be granted for courses taken by examination at other institutions.

The Academic Retention Plan

The academic average of a transfer student at the University of Maryland is based *only* on those courses actually taken at the University. Credit hours for courses taken at other institutions may be transferred, but grades and quality points do not transfer. The level of expectation of academic performance, however, is determined by the total number of credit hours transferred plus the number of hours attempted at the University.

RESIDENCY POLICY

Students who are minors are considered to be resident students if at the time of their registration their parents have been domiciled in the State of Maryland for at least six months.

The status of the residence of a minor is determined at the time of his first registration in the University and may not thereafter be changed by him unless his parents move to and become legal residents of Maryland by maintaining such residence for at least six months. However, the right of the minor student to change from a non-resident status to resident status must be established by his parents or legal guardian prior to the registration period set for any semester.

Adult students are considered to be residents if at the time of their registration they have been domiciled in Maryland for at least six months provided such residence has not been acquired while attending any school or college in Maryland or elsewhere. An adult may change his status from nonresident to resident by withdrawing from the University for six months and *remaining* in the state as a civilian not enrolled in any other institution for more than eight semester hours of credit. Time spent on active duty in the armed services while stationed in Maryland will not be considered as satisfying the six months period referred to above unless the individual's home of record on his official military records is the State of Maryland. In the case of both military personnel and adults, however, residence may be established through ownership and maintenance of a home in the state which is the student's primary place of domicile.

Procedures are available for reviewing the residence status of students. Individuals seeking to appeal the decisions concerning their residence status should contact the Office of Admissions.

The word "domicile" as used in this regulation shall mean the permanent place of abode. For the purpose of this rule only one domicile may be maintained.

THE SPECIAL STUDENT

Applicants over 21 years of age who qualify for admission but who do not desire to work toward a baccalaureate degree may be admitted as special students. These students are ineligible to matriculate for a degree until they have submitted all required documents. Permission from the dean of the various schools and colleges of the University is often needed in order to enroll as a special student.

Special students who have received a baccalaureate degree are advised that no credit earned while enrolled as special students may be applied at a later date to a graduate program. These post-baccalaureate students may enroll for courses at the 100 to 599 level for which they possess the necessary prerequisites, but may not enroll in courses restricted to graduate students only.

THE FOREIGN STUDENT

The foreign student applying for admission to the undergraduate schools of the University of Maryland must make application at least six months in advance of the term for which he is applying. The only exception to this is an immigrant residing in the State of Maryland who may use application deadlines established for American students. All applicants will be required to submit (1) an application for admission form furnished by the Admissions Office of the University upon request, (2) official copies of his secondary school preparation, (3) certificates of completion of state secondary school examinations, and (4) records of college or university studies completed in schools in the United States or elsewhere. He will also be required to furnish proof of adequate finances and of his ability to read, write, speak, and understand English sufficiently well to pursue satisfactorily an approved course of study in one of the colleges of the University. Information may be secured from the Office of International Education Services and Foreign Student Affairs about where and when the required English test (The Testing of English as a Foreign Language, "TOEFL") can be taken, both in the United States and in other countries.

The foreign student accepted for admission to the University will receive from the Director of Foreign Student Affairs the appropriate immigration form needed to secure a student visa from the American consul.

Every foreign student is expected to notify the Director of Foreign Student Affairs as to the approximate date of his arrival at the University and arrange to arrive in time for the special orientation program that precedes registration. The office of the Director is located in the North Administration Building, Room 222-A.

APPLICATION PROCEDURES

Application Forms

Application forms may be obtained by writing to:

Director, Office of Admissions
North Administration Building
University of Maryland
College Park, Maryland 20742

Application forms also are supplied to Maryland high schools. Seniors in high school may obtain the forms from their high school counselors.

All applicants must comply fully with the directions printed on the application form. Incomplete forms cannot be processed.

Application Fee

A non-refundable $10.00 application fee is required with each application.

Enrollment Deposit

Applicants for the September term who are found to meet admission requirements may be

sent an offer of admission. They are then required to submit the enrollment deposit of $50 within three weeks after the date of this offer. Failure to submit the enrollment deposit within the required time limit will be taken as evidence that the applicant is not seriously interested in admission, and the offer will be cancelled.

Refunds of the $50 enrollment deposit will be made provided the request for the refund is received by the Admissions Office on or before June 1 for those students who plan to enter in September.

CLOSING DATES FOR APPLICATIONS

Fall Semester

All applications for undergraduate admission for the fall semester at the College Park campus must be received by the University on or before June 1. (Note: Foreign students are required to submit application six months in advance of registration. Applications including supporting documents for the School of Architecture must be received on or before March 1.) High school students are encouraged to file their applications during the fall months of their senior year.

All supporting documents for an application for admission must be received by the appropriate University office on or before July 15. Supporting documents include education records (except current summer school grades), SAT scores (in the case of new freshmen) and medical examination reports.

Spring Semester

The deadline for the receipt of applications for the spring semester is December 1. All supporting documents for an application must be received on or before the first workday after January 1. (Foreign students are required to submit applications six months in advance.)

ORIENTATION PROGRAMS

Freshmen Orientation and Registration

Upon final admission to the University the student will receive materials pertaining to his participation in The Freshmen Orientation and Registration Program for the University of Maryland. ALL ENTERING FRESHMEN ARE REQUIRED TO ATTEND THIS PROGRAM which is administered by the Director of Orientation of the Office of Student Activities. The primary goals of the program are to inform the student about the University and help him register for the fall semester. The program is operated at the College Park campus during the months of July and August. Each freshman will attend with a group of his future classmates. He will engage in the following:

1. Formal and informal discussions about University life and the standards of performance the University will expect of him.
2. A conference with a faculty advisor in his college who will assist him in selecting and registering for fall semester courses. (To assure the success of this conference, please have the SAT scores submitted to the University early in the spring.)
3. Payment of fall semester fees and charges and, if he so desires, purchase of his textbooks.

Through this program, the entering student receives a personalized and individual introduction to the University.

Transfer Student Orientation

Upon admission to the University, the transfer student receives information concerning an orientation program that is held during the summer. This program includes a conference with representatives of his college to explain academic requirements, as well as a general orientation to the campus itself. The program is particularly geared to the needs of upper class students and their special concerns.

Parent Orientation

Running concurrently with the summer programs for freshmen and transfer students is an orientation program for the parents of new students. Here, parents have an opportunity to learn about the academic, cultural, and social aspects of University life, from administrators and staff as well as from the student sponsors who lead the student groups.

Foreign Student Orientation

All foreign students admitted to the University including transfer students are required to attend the special orientation program arranged by the Office of Foreign Student Affairs with the cooperation of the International Club. This program is held during the week preceding registration each semester. The program is designed to help new students become acquainted with the University and the community in order to understand the opportunities and responsibilities presented by their new educational and cultural environment.

For information about any of the orientation programs, please write:

Orientation Director
Student Union
University of Maryland
College Park, Maryland 20742

For information concerning Foreign Student Orientation contact:

Foreign Student Office
Room 222-A
North Administration Bldg.
University of Maryland
College Park, Md. 20742

SUMMER SCHOOL

New freshmen students who have met the regular University admission requirements for fall enrollment may begin their studies during the summer rather than await September. The final date for admission to Summer School is June 1.

The student who enters on this basis and who continues attending summer sessions can shorten his college career by a semester or by a year, depending upon his curriculum and the progress he makes in it.

Courses which are offered during the summer are the same in content and in instruction as are courses offered during the fall and spring semesters. Many students have found the transition from secondary school to college facilitated by attending the summer session. Undergraduate students attending the eight-week session are permitted to register for a maximum of nine semester hour credits.

For additional information write for a Summer School Catalog, which may obtained from the Director of the Summer School, College Park, Maryland 20742.

UNIVERSITY COLLEGE

University College subscribes to the philosophy that continuing education is essential to meet the demands of today's complex society. Thus, the College, in contrast to the usual practical of bringing students to the University, makes educational opportunities available to adult students at hours and locations convenient for them.

As a result of this philosophy, most University College courses are given in the evening. Therefore, the average undergraduate—that is, a person who wishes to be a full-time day student—would have little reason to enroll with University College, nor would he be allowed to do so, except in special cases. However, if a student who first enrolls as a full-time day student later finds it necessary to take a daytime job, he may then take evening courses with University College.

The Off-Campus Division of University College offers courses for teachers in most of the counties in Maryland. The College Park Evening Division offers courses on campus.

To enroll in University College, students who have never attended a college or university must have either an acceptable high school diploma or the high school equivalent; students who have attended another college or university must be in good academic standing. Further information about admision requirements may be obtained from a University College advisor (call 454-2311 for an appointment) or from the University College Catalog, which may be obtained by writing to the Dean, University College, University of Maryland, College Park, Maryland 20742.

The College does not offer correspondence courses.

GENERAL

All fees are due and payable in full at time of registration. Returning students will not be permitted to complete registration until all financial obligations to the University including library fines, parking violation assessments and other penalty fees and service charges are paid in full.

All checks or money orders should be made payable to the University of Maryland for the exact amount due. In cases where the University has awarded a grant, scholarship, or workship, the appropriate amount will be deducted on the bill.

No degree will be conferred, nor any diploma, certificate, or transcript of record issued to a student who has not made satisfactory settlement of his account.

Although changes in fees and charges ordinarily will be announced in advance, the University reserves the right to make such changes without prior announcement.

FEES FOR RESIDENTS AND NON RESIDENTS
1971-72 ACADEMIC YEAR

	Fall Semester	*Spring Semester*	*Total*
Fees for full-time Undergraduate Students:			
Maryland Residents ***			
Fixed Charges	$ 230.00	$ 230.00	$ 460.00
Instructional Materials	13.00	13.00	26.00
Athletic Fee	30.00	**	30.00
Student Activities Fee	18.00	**	18.00
Auxiliary Facilities Fee	15.00	**	15.00
Recreational Facilities Fee	40.00	**	40.00
	346.00	243.00	589.00
Board Contract *	310.00	310.00	620.00
Lodging	215.00	215.00	430.00
	$ 871.00	$ 768.00	$1,639.00
Residents of District of Columbia, Other States and Other Countries			
Fixed Charges and Other Fees (Same as above)	$ 346.00	$ 243.00	$ 589.00
Non Resident Fee	350.00	350.00	700.00
	696.00	593.00	1,289.00
Board Contract *	310.00	310.00	620.00
Lodging	265.00	265.00	530.00
	$1,271.00	$1,168.00	$2,439.00

*Cash board plan is available

**Students who register for the spring semester but who were not enrolled in the fall semester are required to pay the following additional fees: Athletic Fee, $15.00; Student Activities, $9.00; Auxiliary Facilities Fee, $7.50; Recreational Facilities Fee, $20.00.

***For definition of residency, see page 6.

The above schedule of fees does not include special course fees, book costs and personel expenses.

Explanation of Fees

The application fee for the undergraduate colleges and the summer session partially defrays the cost of processing applications for admission to the University. If a student enrolls for the term for which he applied, the fee is accepted in lieu of the matriculation fee. Applicants who have enrolled with the University of Maryland in its Evening Division at College Park or Baltimore, or at one of its off-campus centers are not required to pay the fee since they have already paid a matriculation fee.

The Fixed Charges Fee is charged to help defray the cost of operating the University's program at College Park.

The Instructional Materials Fee represents a charge for instructional materials and/or laboratory supplies furnished to students. Full-time undergraduate students subject to the fees set forth below will be billed the appropriate fee and also will be billed the Instructional Materials Fee: Math 1, $45; Applied Music, $40; and P.E. 8 Riding Class, $26.

The Athletic Fee is charged for the support of the Department of Intercollegiate Athletics. All students are encouraged to participate in all of the activities of his department or to attend the contests if they do not participate.

The Student Activities Fee is a mandatory fee included at the request of the Student Government Association. It covers class dues and is used in sponsoring various student activities, student publications and cultural programs.

The Recreational Facilities Fee is paid into a fund which will be used to expand the recreational facilities on the College Park campus, especially the Student Union Building.

The Auxiliary Facilities Fee is paid into a fund which is used for expansion and operation of various facilities such as roads, walks, campus lighting and other campus facilities. These facilities are not funded or are funded only in part from other sources.

OTHER FEES

Application Fee ..... $ 10.00

Enrollment Deposit Fee 50.00
This fee is non-refundable after June 1st. At time registration fee will be applied against University charges)

Registration Fee — Pre-College Orientation Program 15.00

Late Application Fee 25.00

Matriculation Fee 10.00

Graduation Fee for Bachelor's degree 10.00

Room Deposit Fee payable upon application for dormitory room 50.00
(To be deducted from the first semester room charges at registration.)

Vehicle registration fee 10.00
($10.00 for first vehicle and $2.00 each for additional vehicles in accordance with published regulations. Payable each academic year by all students registered for classes on the College Park campus and who drive on the campus.)

Special Fee for students requiring additional preparation in Mathematics, per semester 45.00
(Required of students whose curriculum calls for Math 10 or 18 and who fail in qualifying examination for these courses. Students enrolled in this course and concurrently enrolled for 6 or more credit hours will be considered as full-time students for purposes of assessing fees.)

Special Guidance Fee per semester (for students who are required or who wish to take advantage of the effective study course, and/or the tutoring service offered by the Office of Intermediate Registration) 15.00

Applied Music Fee (each course) 40.00

Riding Class Fee 26.00

Fees for Auditors and courses taken for audit are the same as those charged for courses taken for credit at both the undergraduate and graduate levels. Audited credit hours will be added to hours taken for credit to determine whether or not an undergraduate student is full-time or part-time for fee assessment purposes.

Special students are assessed fees in accordance with the schedule for the comparable undergraduate or graduate classification.

MISCELLANEOUS FEES AND CHARGES

Part-time Undergraduate Students:

Fee per credit hour 22.00

Auxiliary Facilities Fee — Payable each semester or summer session 4.00

Vehicle Registration Fee 10.00
($10.00 for first vehicle and $2.00 each for additional vehicles in accordance with published regulations. Payable each academic year by all students registered for classes on the College Park campus and who drive on the campus.)

(The term "part-time students" is interpreted to mean undergraduate students taking 8 semester credit hours or less. Students carrying 9 semester hours are considered to be full-time and must pay the regular full-time fees.)

Late Registration Fee 20.00
(All students are expected to complete their registration, including the filing of class cards and payment of bills, on the regular registration days. Those who do not complete their registration during the prescribed days must pay this fee.)

Fee for change in registration 5.00

Fee for failure to report for medical examination appointment 2.00

Special Examination Fee — to establish college credit — per semester hour 5.00

Transcript of Record Fee (one transcript furnished without charge) 1.00

Property Damage Charge: Students will be charged for damage to property or equipment. Where responsibility for the damage can be fixed, the individual student will be billed for it: where responsibility cannot be fixed, the cost of repairing the damage or replacing equipment will be prorated.

Service Charges for Dishonored Checks: Payable for each check which is returned unpaid by the drawee bank on initial presentation because of insufficient funds, payment stopped, post-dating, drawn against uncollected items etc.

For checks up to $50.00 ..... 5.00

For checks from $50.01 to $100.00 ..... 10.00

For checks over $100.00 ..... 20.00

Library Charges:

Fine for failure to return book from General Library before expiration of loan period .....per day .25

Fine for failure to return book from Reserve Shelf before expiration of loan period

First hour overdue on first day 1.00

After first hour on first day 2.00

Each additional day 2.00

In case of loss or multilation of a book, satisfactory restitution must be made.

In the event it becomes necessary to transfer uncollected charges to the Cashier's office, an additional charge of $1.00 is made.

TEXTBOOKS AND SUPPLIES

Textbooks and classroom supplies: These costs vary with the course pursued, but will averege per semester 85.00

Payment of Fees: Registration is not complete until all fees are paid in full. All checks, money orders, or postal notes should be made payable to the University of Maryland.

WITHDRAWAL AND REFUND OF FEES

Any student compelled to leave the University at any time during the academic year should file an application for withdrawal, bearing the proper signature, in the Registrations Office. If this is not done, the student will not be entitled, as a matter of course, to a certificate of honorable dismissal, and will forfeit his right to any refund to which he would otherwise be entitled. The date used in computing refunds is the date the application for withdrawal is filed in the Registrations Office.

In the case of a minor, withdrawal will be permitted only with the written consent of the student's parent or guardian.

Students withdrawing from the University will be credited for all academic fees charged to them in accordance with the following schedule:

Period from Date Instruction Begins	Refundable
Two weeks or less	80%
Between two and three weeks	60%
Between three and four weeks	40%
Between four and five weeks	20%
Over five weeks	00%

No part of the charges for room and board is refundable except where the student officially withdraws from the University or where he is given permission by the appropriate officials of the University to move from the residence halls and/or to discontinue dining hall privileges. In these cases, the room refund will be computed by deducting ten percent of the charge for the semester as a service charge and the remainder will be prorated on a weekly basis. Refunds to students having full board contracts will be calculated in the same manner. No room and/or board refunds will be made after the fourteenth week of the semester. ID Cards with dining hall validation issued to boarding students must be surrendered at the Auditor's Office in the South Administration Building on the day of withdrawal before any refund will be processed.

In computing refunds to students who have received the benefit of scholarships and loans from University Funds, the computation will be made in such a way as to return the maximum amount to the scholarship and loan accounts without loss to the University.

No refund of the Athletic, Student Activity, Special Recreational Facilities, and Advisory and Testing Fees is made to students who withdraw at the close of the first semester.

A student who registers as a full-time undergraduate will receive no refunds of Fixed Charges, Instructional Materials Fee, Athletic Fee, etc., when courses are dropped (irrespective of the number of credit hours dropped) unless the student withdraws from the University.

A student who registers as a part-time undergraduate student will be give an 80 percent refund of credit hour fees for courses dropped during the first week of classes. No refunds will be made for courses dropped thereafter.

A special refund schedule applies to full-time students who are drafted into the Armed Services or called up as Reservists.

TRANSCRIPTS OF RECORDS

Students and alumni may secure transcripts of their scholastic records from the Registrations Office. No charge is made for the first copy; for additional copies, there is a charge of $1.00 for each transcript. Checks should be made payable to the University of Maryland. Transcripts of records should be requested in writing at least two weeks in advance of the date when the records are actually needed. No transcript of a student's record will be furnished any student or alumnus whose financial obligations to the University have not been satisfied.

FINANCIAL AID

The Office of Student Aid provides advice and assistance in the formulation of student financial plans and, in cooperation with other University offices, participates in the awarding of scholarships, loans, and part-time employment to deserving students. Scholarships, grants and loans are awarded on the basis of evident academic ability and financial need. In making awards, consideration is also given to character, achievement, participation in student activities, and to other attributes which may indicate success in college. It is the intent of the committee to make awards to those qualified who might not otherwise be able to pursue college studies. Part-time employment opportunities on campus are open to all students, but are dependent upon the availability of jobs and the student's particular skills and abilities.

Additional information is available from the Director, Office of Student Aid, Room 222, North Administration Building, University of Maryland, College Park, Maryland 20742.

SCHOLARSHIPS AND GRANTS

Most scholarships are awarded to students before they enter the University. However, students who have completed one or more terms, and have not received such award, are eligible to apply. Most of these scholarships are awarded to students who have earned a cumulative grade point average of 3.0 (B) or better. Entering freshmen must submit applications before March 1; students already enrolled in the University may submit applications between February 10 and May 1 in order to receive consideration for scholarship assistance for the ensuing year.

Scholarship award letters are normally mailed between May 1 and July 1. Any applicant who does not receive an award letter during this period should assume that he has not been selected for a scholarship.

FULL SCHOLARSHIPS. The University awards 56 full scholarships covering board, lodging, fixed charges, and fees. Not more than twenty of these

scholarships may be held by out-of-state students, and at least twelve are reserved for women. Scholastic achievement and participation in student activities are given primary consideration.

UNIVERSITY GRANTS. The University awards to deserving and qualified secondary school graduates a limited number of grants covering fixed charges only.

GENERAL ASSEMBLY GRANTS. These grants are awarded by members of the State Legislature. They may be awarded to persons living in the legislative district which the Delegate or Senator represents.

SPECIAL ACADEMIC SCHOLARSHIPS. A limited number of scholarships are awarded each year to students of exceptional ability out of funds derived from campus enterprises. The amount of these scholarships varies, depending upon the extent of need.

GENERAL STATE SCHOLARSHIPS. The General Assembly of Maryland provides a number of limited scholarships to students entering college for the first time. The scholarships may be used in any approved institution of higher education within the State. Awards are made by the State Scholarship Board based upon financial need and the results of a competitive examination. For additional information, contact high school guidance counselors or the Maryland State Scholarship Board, 2100 Guilford Avenue, Baltimore, Maryland 21218.

ENDOWED SCHOLARSHIPS AND GRANTS. The University has a number of endowed scholarships and special grants. These range in value from $100 to $1,000. Recipients are chosen by the University in accordance with terms established by the donor. It is usually inadvisable for a student to apply for a specific scholarship. Each applicant will receive consideration for all scholarships for which he is eligible.

EDUCATIONAL OPPORTUNITY GRANTS. Under provisions of the Higher Education Act of 1965, limited grants are available to encourage youths of exceptional financial need to continue their post-secondary school education. A recipient must be a United States citizen enrolled as a full-time undergraduate. The amount of the grant must be matched by an equal amount of some other type of aid provided through the University.

NURSING SCHOLARSHIPS. Nursing students of exceptional financial need are eligible to receive assistance under the provisions of the Health Manpower Act of 1968. Students submitting applications for financial aid will be automatically considered for both scholarship and loan.

LOCAL AND NATIONAL SCHOLARSHIPS. In addition to the scholarships provided by the University of Maryland, a student should give careful consideration to scholarship aid provided by local and national scholarship programs. Ordinarily, the high school principal or counselor will be well informed as to these opportunities.

LOANS

Loan funds to meet educational expenses are available for students enrolled in the University. The extent of financial need must be clearly established by providing a complete statement of the applicant's financial resources and estimated expenses for the academic year.

Loan awards are normally granted on a yearly basis, although short-term and emergency loans are granted for shorter periods.

To apply for a long-term loan, an application should normally be filed before July 1 for the ensuing year. If funds are available, applications may be considered at other times, but the student should bear in mind that it generally takes about six weeks to process a loan.

Students applying for a loan must have a 2.0 (C) average for courses taken the preceding semester. New students need a 2.5 average in academic subjects for the previous two years of school.

Loans are not available for non-educational expenses, nor are they available for repayment of previously incurred indebtedness.

NATIONAL DEFENSE EDUCATION ACT LOAN FUND. This loan fund was etablished by the Federal government in agreement with the University of Maryland to make low-interest loans available to superior students with clearly established financial need. Applicants must be United States nationals (citizens and permanent resident status) and must be enrolled for eight or more credit hours at day school on the College Park campus.

If funds are available, a student may request up to $1,000 per year; the average approved loan is about half this amount. The borrower must sign a note. Repayment begins one year after the borrower leaves school and must be completed within ten years thereafter. No interest is charged until the beginning of the repayment schedule. Interest after that date is charged at the rate of three percent per annum.

U. S. LOAN PROGRAM FOR CUBAN STUDENTS. Loan funds are available to Cuban nationals under terms similar to the NDEA Loans.

NURSING STUDENT LOANS. Loans up to $1,500 per year are available under provision of the Nurses Training Act of 1964. The borrower must be a full-time student pursuit of a baccalaureate or graduate degree in nursing and able to establish financial need. Repayment begins one year after the borrower ceases to be a full-time student and must be completed within ten years thereafter. No interest is charged until the beginning of the repayment schedule. Interest after that date accrues at the rate of three percent per annum.

Up to fifty percent of the loan plus interest may be cancelled in the event that the borrower is employed full-time as a nurse in a public or nonprofit institution or agency. Such cancellation is at the rate of ten percent per year. In the event of total or permanent disability or death, the borrower's obligation is automatically cancelled.

INSTITUTIONAL STUDENT LOANS. Institutional loan funds have been established through the generosity of University organizations, alumni, faculty staff, and friends. These loans are normally available at low interest rates to upperclassmen only. For specific information, the student should inquire at the Office of Student Aid.

LAW ENFORCEMENT EDUCATION PROGRAM LOAN AND GRANT. Loans: Qualified full-time pre-service students in approved fields may apply for loan assistance up to $1,800 per academic year. The loan is cancelled at the rate of 25 percent per year of full-time employment in criminal justice or repaid at the rate of 7 percent simple interest, commencing six months after termination of full-time study. Grants: In-service employees of police, courts and corrections agencies enrolled in courses related to law enforcement can receive up to $300 per semester (not to exceed cost of tuition and fees). Grant recipients must agree to remain in the service of their employing law enforcement agency for at least two years following completion of their courses. Any student who meets the eligibility requirements for both a loan and a grant may receive both concurrently. Interested students should contact either the Dean, University College, or Director, Institute of Criminal Justice and Criminology, College of Arts and Sciences.

BANK LOANS. Loan programs have been established through the Maryland Higher Education Loan Corporation and the United Student Aid Fund which permit students to borrow money from their hometown banks. The programs enable undergraduates in good standing to borrow up to $1,250 per year, and notes may not bear more than seven percent simple interest. Monthly repayments begin ten months after graduation or withdrawal from school. The Federal government will pay the interest while the student is in school. Further details and a listing of participating banks may be secured from the Office of Student Aid.

PART-TIME EMPLOYMENT

More than one-half of the students at the University of Maryland earn a portion of their expenses. The Office of Student Aid serves without charge as a clearing house for students seeking part-time work and employers seeking help. Many jobs are available in the residence halls, dining halls, libraries, laboratories, and elsewhere on campus and off campus.

Working during college years may offer advantages in addition to the obvious one of financing a college education. The employed student has a special opportunity to learn new skills, to develop good work habits, and to learn how to get along with people. Part-time employment experience often is helpful to the student in making his career choice.

The Office of Student Aid welcomes the opportunity to counsel a student about employment. However, securing a position through intelligent application and retaining that position through good work is the individual's responsibility.

Freshman students who do not need financial aid probably should not attempt to work during the first year at the University. Adjustment to college study and to the changes from life at home usually require the student's best efforts without the added responsibility of partial self-support.

However, freshman students who need to work in order to attend the University are advised to consider employment in one of the dining halls. A student may earn approximately one-half of his board and room by working ten hours per week. After one successful semester the work load may be increased, at the request of the student, up to a maximum of 20 hours per week.

For positions other than food service, a student normally cannot arrange for employment until he is on campus at the beginning of a school session. Application must be made in person and the applicant should have a schedule of his classes and study hours so that he can seek employment best suited to his free time.

Foreign students must have clearance from the Office of Foreign Student Affairs before they may engage in employment.

COLLEGE WORK-STUDY PROGRAM

Eligible students may seek employment under provisions of Title 1-C of the Economic Opportunity Act. Qualified students may work up to 15 hours per week during the school year and full-time during the summer. It is the intent of the Student Aid Committee to combine this type of assistance with scholarships and loans so that students from low income families will be able to attend the University.

The University of Maryland is accredited by the Middle States Association of Colleges and Secondary Schools and is a member of the Association of American Universities. In addition, individual schools and departments are accredited by such groups as the American Association of Collegiate Schools of Business, the American Chemical Society, the National Association of Schools of Music, the Section of Legal Education and Admissions to the Bar of the American Bar Association, the American Council of Education for Journalism, the American Council on Pharmaceutical Education, the Council on Dental Education of the American Dental Association, the Committee on Accreditation of the American Library Association, the American Psychological Association, the Commission on Accreditation of the Council on Social Work Education, the Council on Medical Education of the American Medical Association, the Engineers' Council for Professional Development, the National Council for Accreditation of Teacher Education, and the National League for Nursing.

GENERAL EDUCATION PROGRAM

A college education implies something more than technical training in a field of specialization. In order that each graduate may gain a liberal education as well as a specialized one, the University has established a General Education requirement. This requirement consists of 34 semester hours of credit in six areas: English (9 hours), fine arts or philosophy (3 hours), history (6 hours), mathematics (3 hours), science (7 hours), and social science (6 hours). There is a wide choice in specific courses which may be used to satisfy requirements in all of the six areas.

The General Education Program is designed to be spread out over the four years of college. In each of the areas, courses for which no previous college course work is prerequisite are available; at the same time, alternative advanced courses are available in most of the areas, Thus, a student may (within the limits of his particular curriculum) satisfy a General Education requirement with a variety of courses at different levels. Which courses he takes will depend on his ability—as determined by advanced credit, placement examination, department evaluation, and class standing—and upon his interests and needs.

It should be emphasized that the 34 semester hours of General Education courses constitute a minimum requirement, applicable to the undergraduate students in all of the colleges of the University of Maryland.

The University is also concerned with the physical fitness of each student. Therefore, all undergraduate men and women students registered for more than eight hours of credit are required to enroll in and successfully complete two prescribed courses in physical education. A health education course of two semesters hours' credit is required of all undergraduate men and women. These courses must be taken by all students taking more than eight hours in a semester during their first

year of attendance at the University whether they intend to graduate or not.

COLLEGE REQUIREMENTS

In addition to fulfilling the General Education requirements, each student will have to meet the specific graduation requirements determined by the faculty of his particular college. These additional course requirements will be found in each individual college section.

ACADEMIC ADVISORS

Each student is assigned a faculty advisor whose function is to aid the student in designing his program of study. The student meets with his advisor in regular conferences each semester and may arrange additional meetings on his own initiative.

Special advisors are assigned to students in the preprofessional curricula.

INTERMEDIATE REGISTRATION

The Office of Intermediate Registration (OIR) is for students who wish to transfer from one college to another within the University, but who lack the necesary 2.00 cumulative grade point average to be able to do so. A student may register in OIR, take courses applicable to the curriculum to which he wishes to transfer, and then transfer to the new college upon earning the necessary average.

The Office also offers the following course:

CLAM 108 (001). College Aims. (1)

This course is primarily aimed at orienting new students toward the practice of efficient study techniques. It will be concerned with such topics as: 1. How to study and develop higher level work skills; 2. Diagnosing and remedying skill disabilities; 3. Handling problem area which distracts students from their studies.

The Office of Intermediate Registration recognizes that students may have difficulty in making vocational decisions. For this reason, OIR assumes the specific goals of providing for all students registered in OIR the opportunity to receive advising for curriculum choice and vocational planning.

The Office of Intermediate Registration is located in Room 215 of the North Administration Building. The telephone number is 454-2733.

INTENSIVE EDUCATIONAL DEVELOPMENT PROGRAM

The Intensive Educational Development Program is designed to provide educational and psychological support to students who enter the University of Maryland from culturally different and low socio-economic backgrounds.

Academic advisement is a critical component of the program. Students enroll in the Office of Intermediate Registration. In addition to registration, continuous group and individual sessions are held throughout the semester.

Group and individual counseling, planned and spontaneous, utilizes nontraditional methods in working with students.

Academic skills are enhanced and improved through group and individual work in the Reading and Study Skills Laboratory. Specific academic lab sessions are set up for the student's individual courses.

Tutoring is provided by a selected group of paid tutors individually and in small groups with a ratio of 1 to 4.

The program recruits and enrolls students from high schools, community agencies, and Upward Bound programs. University of Maryland students may transfer into the program during their first two years.

Students are involved in the planning, implementing and evaluation of the program.

For further information, contact:

Coordinator, IED Program
213 N. Administration Building
University of Maryland
College Park, Maryland 20742

CLASSIFICATION OF STUDENTS

No baccalaureate curriculum requires less than 120 semester hours. Actual classifications run as follows: freshman, 1-27 semester hours; sophomore, 28-55; junior, 56-85; and senior, 86 on up to at least 120.

A student may register for upper division courses when granted junior standing by his college. This shall be based upon earning a minimum of 56 academic hours toward his degree, completing such course requirements as the college may direct, and posessing the minimum required grade point average to remain in the University.

A senior at the University of Maryland who is within seven hours of completing the requirements for the undergraduate degree may, with the approval of his undergraduate dean, the head of the department concerned, and the Graduate School, register in the undergraduate college for graduate courses, which may later be counted for graduate credit toward an advanced degree at this University. The student must be within seven credit hours of completing his undergraduate work and the total of undergraduate and graduate courses must not exceed fifteen credits for the semester. Excess credits in the senior year cannot be used for graduate credit unles proper pre-arrangement is made. Seniors who wish to register for graduate credit should apply to the Graduate School.

SPECIAL OPPORTUNITIES

Advanced Placement

Students entering the University from secondary school may obtain advanced placement and college credit on the basis of their performance on the College Board Advanced Placement examinations. These examinations are normally given to

eligible high school seniors during the May preceding matriculation in college.

For achievement of a score of five or four on a given examination, the student will be granted Advanced Placement and the credit equivalent of two semester courses in that field; for achievement of a score of three, Advanced Placement and the credit equivalent of either one or two semester courses, depending upon the field of the examination, will be granted. A student earning a score of 2 on the English advanced placement examination will not need to take English Composition, but no credit will be given.

The program allows students a maximum of thirty hours credit, which may be used to meet major, minor, or elective requirements; or, where appropriate, General Education requirements. Included in the University's program are Advanced Placement examinations in the following areas: biology, chemistry, English, French, German, history, Latin, mathematics, physics and Spanish.

Questions about the program may be addressed to the Director of Admissions and Registrations, College Deans, or the Director of General Education. For detailed information about examinations and procedures in taking them, write to Director of Advanced Placement Program, College Entrance Examination Board, 475 Riverside Drive, New York, New York 10027.

Honors Programs

The Colleges of Arts and Science, Education, Architecture, Business and Public Administration, and Agriculture have created unusual opportunities for the superior student through the establishment of Honors Programs.

Arts and Sciences, Secondary Education, Architecture

The College of Arts and Sciences has instituted both General Honors and Departmental Honors. General Honors, as its name suggests, enlarges the breadth of the student's generalized knowledge; Departmental Honors increases the depth of his knowledge in his major discipline. Both offer the student challenging academic experiences characterized by small sections, active student participation, and an Honors faculty that encourages dialogue. Individually guided research and independent study are important features of Honors work.

Each year a selected group of entering freshmen is invited into the General Honors Program on the basis of their high school records and standardized test scores. The General Honors student, after acceptance, must maintain a B average to continue in the Program.

The more than 20 Departmental Honors Programs ordinarily begin in the junior year, although a few programs begin as early as the freshman year.

By agreement, students in Secondary Education in the College of Education and in the School of Architecture may participate in the Honors Programs of the College of Arts and Sciences.

The student who completes his Honors curriculum successfully is graduated with a citation in General or Departmental Honors, or with both.

Interested high school students should write to the Director of Honors, 104 Francis Scott Key Hall, University of Maryland, College Park, Maryland 20742.

Business and Public Administration

The College of Business and Public Administration has instituted Departmental Honors Programs in Business Administration, Economics, and Government and Politics.

Agriculture

The College of Agriculture has instituted a Departmental Honors Program in Agricultural Economics.

HONOR SOCIETIES

Students who excel in scholarship and leadership may be invited to join the appropriate honor society. These include:

*Alpha Kappa Delta (Sociology)
*Alpha Lambda Delta (Scholarship-Freshmen Women)
Alpha Sigma Lambda (Adult Education)
Alpha Zeta (Agriculture)
Beta Alpha Psi (Accounting)
Beta Gamma Sigma (Business Administration)
*Chi Epsilon (Civil Engineering)
*Eta Kappa Nu (Electrical Engineering)
Gamma Theta Upsilon (Geography)
Iota Lambda Sigma (Industrial Education)
Kappa Delta Pi (Education)
*Mortar Board (Women's Scholarship and Leadership)
Omicron Delta Epsilon (Economics)
*Omicron Delta Kappa (Men's Scholarship and Leadership)
Omicron Nu (Home Economics)
Phi Alpha Epsilon (Physical Education)
*Phi Alpha Theta (History)
Phi Beta Kappa (Arts and Sciences)
Phi Delta Kappa (Educational)
*Phi Eta Sigma (Scholarship—Freshmen Men)
*Phi Kappa Phi (Senior and Graduate Scholarship)
*Phi Sigma (Biology)
Pi Alpha Xi (Floriculture)
Pi Mu Epsilon (Mathematics)
*Pi Sigma Alpha (Political Science)
*Pi Tau Sigma (Mechanical Engineering)
*Psi Chi (Psychology)
Sigma Alpha Eta (Speech Therapy)
Sigma Alpha Iota (Women's Music)
Sigma Alpha Omicron (Bacteriology)
*Sigma Pi Sigma (Physics)
*Tau Beta Pi (Engineering)

*Members of Association of College Honor Societies.

LIBRARIES

The Theodore R. McKeldin Library is the general library of the University, containing reference works, periodicals, circulating books, and other materials in all fields of research and instruction. Branch libraries include the Engineering and Physical Sciences Library, the Architecture Library, and the Chemistry Library.

The libraries on the College Park campus include approximately 1,000,000 volumes and 12,000 subscriptions to periodicals and newspapers, as well as many uncatalogued government documents, phonorecords, films and filmstrips, etc.

Special collections include those of Richard Van Mises in mathematics and applied mechanics; Max Born in the physical sciences; Thomas I. Cook in political science; Romeo Mansueti in the biological sciences; Katherine Anne Porter; Maryland; U.S. government publications (for which the University is a regional depository); documents of the United Nations, the League of Nations, and other international organizations; agricultural experiment station and extension service publications; maps from the U.S. Army Map Service; the files of the Industrial Union of Marine and Shipbuilding Workers of America; the Wallenstein collection of musical scores; and research collections of the American Bandmasters Association, the National Association of Wind and Percussion Instructors and the Music Educators National Conference. In addition, the collections include microfilm productions of government documents, rare books, early journals, and newspapers.

Other Area Resources

The College Park campus is in a region rich in research collections. In the Washington area are the Library of Congress, the National Archives, the Folger Library, the National Library of Medicine, the National Agricultural Library, and various academic and special libraries. In the Baltimore area, in addition to the University's own libraries at UMBC and on the professional campus, are the Enoch Pratt Free Library and the Maryland Historical Association Library. The Maryland Hall of Records is located in Annapolis.

RESEARCH FACILITIES

The research programs at the University derive their existence and vigor from a faculty comprised of internationally recognized scholars and scientists. It is an advantage for undergraduate students to be aware of the University's research facilities as they plan their program.

In addition to fine library resources and the usual laboratory facilities for undergraduate studies, the University has developed outstanding opportunities for research in the biological, physical, and social sciences. Among the exceptional facilities are the Institute for Child Study; the Natural Resources Institute; a Computer Science Center; a laboratory for basic behavioral research on animals; Van de Graaff accelerators; a training nuclear reactor; a full-scale, low-velocity wind tunnel; a psycho-pharmacology laboratory; and laboratory models for meteorological phenomena. Collaborative arrangements with many nearby government agencies permit University students and faculty to utilize their research facilities. The University owns and operates the world's longest radio telescope, located in California. A 160 MVE cyclotron for research in nuclear studies is located on the College Park campus.

Investigation in agriculture is an important aspect of University research. University farms total more than 2,000 acres. Breeding, selection in farm crops, and soil research are a part of the program. Work in these areas is augmented by X-ray equipment and an electron microscope.

PART I—

A. GENERAL POLICY

The University's approach to student discipline is primarily an educative and preventive one. It asumes that discipline is properly the concern of the entire University community—the student body, the faculty and the administration.

In order that uniform standards may be maintained, all disciplinary action concerning students or student organizations is subject to review by the Adjunct Committee on Student Discipline of the University Senate. The rules and regulations of any organization or department that wishes to establish a disciplinary unit must be submitted to the Adjunct Committee on Student Discipline and the Vice Chancellor for Student Affairs for approval or modification.

Cases involving infractions of University rules, other than academic, which apply to all students are referred immediately to the Student Affairs Judiciary Office on the College Park campus or to the Dean of the school in which the student is registered in Baltimore. (Graduate students are referred to the Dean of the Graduate School.) The Judiciary Office or the Dean will investigate the case and take appropriate action.

In situations involving undergraduates, the Student Affairs Judiciary Office will refer the case to one of the student judicial boards for appropriate action, according to the jurisdictional area of the various student boards and the seriousness and nature of the offense. The Student Affairs Judiciary Office may handle directly those cases it judges to involve students needing special remedial or rehabilitative action and those cases where an administrative hearing is requested by the student.

Students charged with violating University regulations are guaranteed administrative due process in the handling of the charges, the conduct of the hearings, the imposition of sanctions, and the right of appeal.

B. SUSPENSION OF A STUDENT FROM CLASS

Discipline in the classroom is the responsibility of the faculty member in charge of the class. Misbehavior of a type that interferes with the educational efficiency of a class will be considered sufficient cause for suspending a student from the class. If a student is suspended from class for disciplinary reasons, he should report immediately to the department head. The department head will investigate the incident and will report it to the academic dean and to the Student Affairs Judiciary Office, in order to determine whether or not past disciplinary action has been taken against the student. The department head will then write a letter to the student indicating the disposition of the case. The student will be required to present this letter to his insructor before he can be readmitted to class. A copy of this letter will be sent to the Student Affairs Judiciary Office.

Disruption of a class by a student not enrolled in that class can be referred to the Judiciary Office. Disruption by a non-student can be referred to the campus police.

C. SUSPENSION OF A STUDENT FROM ACTIVITIES OR UNIVERSITY FACILITIES

The individual or group of individuals in charge of any department, division, organization, building, facility or any other unit of the University (e.g., Dining Hall, Student Union, etc.) shall be responsible for student discipline within such units. The person responsible for each unit may suspend the student or student organization from the unit. The suspended student or representative of the student organization will be referred immediately to the Student Affairs Judiciary Office. The Judiciary Office will investigate the incident and notify the student of the disposition of the case. The individual responsible for the suspension will be notified before the student or his organization can be readmitted. A file of such actions shall be kept in the Judiciary Office.

D. IDENTIFICATION CARDS

Official University of Maryland student identification cards and transaction plates are issued to all registered undergraduate and graduate students. The identfication card and the transaction plate are for use only by the student to whom issued and may not be transferred or loaned to another individual for any reason. Loss of either the I.D. card or the transaction plate, or both, should be reported at once to the Office of the Vice Chancellor for Student Affairs. A replacement fee of $3.00 for each item is required prior to the creation of authorized duplicates.

E. IMPORTANT UNIVERSITY REGULATIONS WHICH APPLY TO ALL STUDENTS

The following behavior may result in referral to the Student Affairs Judiciary Office for appropriate action. Typically, disciplinary sanctions will be imposed not only for individual misconduct which demonstrates a disregard for institutional behavioral standards, but also for conduct which indicates disregard for the rights and welfare of others as members of an academic community. Such conduct may ultimately call into question the student's membership in the University community, either because he has violated elementary standards of behavior necessary for the maintenance of an educational milieu or because his continued presence at the University adversely affects the ability of others to pursue their educational goals.

1. VIOLATION OF FIRE REGULATIONS—This includes failure to comply with evacuation procedures, tampering with fire-protection apparatus, use or possesion of fireworks or firearms, or use of open-flame devices or combustible materials which endangers the safety or well-being of the University community; or unauthorized use of electrical equipment.
2. BEHAVIOR WHICH JEOPARDIZES THE SAFETY OR WELL-BEING OF OTHER MEMBERS OF THE UNIVERSITY COMMUNITY OR PERSONS COMING ONTO UNIVERSITY PROPERTY—This includes physical harrassment of, or interference with firemen, policemen or other persons engaged in the performance of their official duties; physical abuse or threatening physical abuse of any person on University property; forcible detention of any person on University property.
3. UNAUTHORIZED POSSESSION, USE, OR DISTRIBUTION OF ALCOHOLIC BEVERAGES ON OR IN UNIVERSITY PROPERTY—University policy, consistent with State and County laws, restricts on-campus use of alcoholic beverages in specified areas.
4. POSSESSION, USE, SALE OR DISTRIBUTION ON OR IN UNIVERSITY PROPERTY OF ILLEGAL DRUGS OR OF DRUGS WHICH THE REQUIRED PRESCRIPTION HAS NOT BEEN OBTAINED—This includes possession, use, distribution, sale, manufacture or processing of illegal or unprescribed narcotics, drugs, and/or hallucinogenic substances.
5. DESTRUCTION, THEFT, ATTEMPTED THEFT, OR IMPAIRMENT OF PERSONAL OR UNIVERSITY PROPERTY—Disciplinary action may include a requirement of restitution.
6. UNAUTHORIZED POSSESSION OR USE OF UNIVERSITY KEYS—Keys to rooms or buildings on the University campus may be obtained only through official channels.
7. UNAUTHORIZED ENTRY INTO OR PRESENCE IN A UNIVERSITY BUILDING OR FACILITY—Except for properly scheduled use, classroom, administration and recreation buildings are closed to general student use on holidays, Saturday afternoon, Sundays and after 12 midnight during the week. Students may use a building or facility for a specified purpose upon written permision from a member of the faculty with approval of the academic or administrative officer normally having control over such building or facility, which permission may be revoked or withdrawn.
8. FALSIFICATION, FORGERY, OR MODIFICATION OF ANY OFFICIAL UNIVERSITY RECORD—Identification card, absence excuses, parking stickers, transcripts, examinations, grade cards, admission applications, etc.
9. PLAGIARISM, CHEATING AND OTHER ACADEMIC IRREGULARITIES—A student who violates accepted academic procedure may be referred to the Dean of his College or to

an *Ad Hoc* Commitee on Academic Dishonesty. (See Irregularities in Examinations for specifics)

10. FAILURE TO MEET FINANCIAL OBLIGATIONS TO THE UNIVERSITY—This includes refusal to pay delinquent accounts and use of worthless checks or money orders in payment to the University for tuition, board, fees, library fines, traffic penalties, etc.

11. OBSTRUCTION OF, DISRUPTION OF, OR INTERFERENCE WITH ANY UNIVERSITY ACTIVITY OF AN ACADEMIC NATURE; ACTIONS ON THE PART OF STUDENTS WHICH SUBSTANTIALLY OBSTRUCT, DISRUPT, OR INTERFERE WITH NON-ACADEMIC ACTIVITIES ON UNIVERSITY PREMISES BY MEMBERS OR AUTHORIZED NON-MEMBERS OF THE UNIVERSITY COMMUNITY.

12. VIOLATION OF UNIVERSITY HOUSING REGULATIONS—

13. VIOLATION OF UNIVERSITY CAMPUS TRAFFIC RULES AND REGULATIONS—

PART II—

ENFORCEMENT PROCEDURES

It is a general expectation that individuals and groups will abide by the behavioral guidelines estabilshed by this policy statement. Compliance with these minimal standards for responsible conduct is a necessary condition for maintaining a campus atmosphere in which dissent and demonstrations are viewed as important aspects of the University's educational program.

Reports of violations by undergraduate students will be referred to the Judiciary Office of the Vice Chancellor for Student Affairs and reports of violations by graduate students will be referred to the Dean for Graduate Studies and Research. Actions taken by these offices will follow procedures set forth in this chapter.

When violations continue beyond the enforcement capabilities of the University staff, such outside assistance as is necessary may be requested. These requests will be made in accordance with policy and procedures established by the University.

Disciplinary Actions

1. DISCIPLINARY REPRIMAND

A disciplinary reprimand is written notification from a University official to a student containing a warning that repeated infractions of regulations may result in more severe disciplinary action. A record of the letter will be filed in the Student Affairs Judiciary Office. The student's parents may be notified.

2. CONDUCT PROBATION

This action involves a period of time, not to exceed one year, in which a student is required to show a positive change in behavior. In addition, conditions and restrictions may be imposed, including revocation of specific privileges and recommendations for counseling interviews with the Judiciary Office. The student's parents may be notified. A violation of conduct probation may be the basis for for severe disciplinary action.

3. DISMISSAL FROM UNIVERSITY HOUSING

In the case of a serious violation of house rules, residence hall probation, or housing regulations, a student may be dismissed from University housing for a specified period of time. Such dismissal results in a percentage room and board refund, according to the regular University refund policy.

4. DISCIPLINARY PROBATION

This action involves a period of time, not to exceed one year, during which a student who has been involved in a disciplinary situation (or repeated violations) is given an opportunity to prove that he can become a responsible and effective member of the University community.

In deciding upon the action of disciplinary probation, a judicial board may subject the activities of the student to any one, or more, of the following conditions:

1. A student on disciplinary probation may not represent the University in any extracurricular activities such as intercollegiate athletics, debate teams, University Theatre, or band; however, he may participate in informal activities of a recreational nature sponsored by the University.
2. A student on disciplinary probation may not run for or hold office in any organization that is recognized by the Adjunct Committee on Student Activities.
3. The student's activities may be restricted in other ways which pertain to the type of offense.
4. The student may be required to make restitution or repairs.

When a student has been placed on disciplinary probation, the Office will officially notify the student of the decision and will indicate that any violation of his probationary status may result in supension or expulsion. The Judiciary Office will inform appropriate University authorities of the disciplinary action and may notify the student's parents.

If a student is found guilty by a judicial board of any infraction of University regulations during his probationary period, the board may recommend that he be suspended or expelled from the University.

At the end of the probation period, the student's case will be reviewed by the Judiciary Office. If all conditions of the disciplinary action have been met satisfactorily, the student will be considered in good standing, behaviorally.

5. SUSPENSION FROM THE UNIVERSITY

A student's supension from the University shall be for an indefinite period of time. However, the

Judicial Board recommending this action must specify the date at which he subsequently may apply to the Judiciary Office for readmission, and in no case will this date be later than one year after the effective date of the suspension. The academic record of the student will not in any case affect this application for readmission after suspension for disciplinary reasons. All recommendations for suspension must be approved by the Vice Chancellor for Student Affairs. Parents are notified in all cases.

During the period of suspension, the student may not participate in any University-sponsored activity or in the activities of any recognized University organization. In addition, he will be denied all other rights and privileges which are accorded to students in good standing.

a. Suspended Suspension by Vice Chancellor for Student Affairs.

Suspension is withheld pending careful evaluation of a student's behavior during a probationary period not to exceed one year. If the student is involved in any further offense, this suspension of disciplinary action may be summarily revoked by the Vice Chancellor and the original decision of suspension from the University enforced.

b. Deferred Suspension by Vice Chancellor for Student Affairs.

This is a suspension which becomes effective after a specific future date. It is normally used near the end of a semester to avoid financial penalty that would be entailed by an immediate suspension. Probationary status will exist during this period identical to *suspended* suspension.

6. EXPULSION FROM THE UNIVERSITY

This is the most serious penalty and results in a complete separation of the relations between the University and the student. Parents are informed and permanent notification appears on the student's official transcript. Expulsion must be approved by the President of the University.

APPEALS

Any disciplinary decision may be appealed to the next higher disciplinary unit. The highest board of appeal is the Adjunct Committee on Student Discipline of the University Senate. An appeal must be made through the Judiciary Office or through the Dean who is responsible for the administration of the decision being appealed. It will be forwarded to the appropriate judicial board for review. The appeal must be in writing, must indicate the basis for the appeal, and must be made within ten days of the date the student was notified of the decision which he is appealing. In hearing an appeal, the next higher disciplinary unit may affirm or reduce the original decision or may return the decision to the lower board for reconsideration.

STUDENT DISCIPLINARY RECORDS

All disciplinary actions by the judicial boards are reported to the Judiciary Office of the Vice Chancellor for Student Affairs where they will be recorded. All records of disciplinary action, except those resulting from expulsion, will remain confidential, will be segregated from the student's academic record, and will not be available to unauthorized persons on campus, or to any person off campus, without the express consent of the student involved, except under legal compulsion or in cases where the safety of persons or property is involved.

Except in cases where the student has demanded a public hearing, disciplinary action is confidential; and no member of a judicial board may disclose any information concerning the hearing, the student's prior disciplinary record, the current disciplinary action taken, or any information as to the voting. Any public release of information concerning disciplinary action will be isued only by the Judiciary Office. According to a policy established by the Adjunct Committee on Student Discipline, names of students involced in disciplinary action may not be printed in campus publications and may not be made public. Any judicial board may recommend that no publicity of any nature be released by the Judiciary Office on a case if circumstances so warrant.

PART III—DISCIPLINARY RULES AND PROCEDURES

A. GENERAL

1. The following rules and procedures are hereby declared to be in addition to and supplementary of any and all rules and regulations which are not or hereafter may be applicable to any campus under the jurisdiction of the Board of Regents of the University (the Regents). The jurisdiction conferred in the plans for the Undergraduate Judicial System and the Graduate Judicial System adopted in 1969, as from time to time amended, is hereby preserved, provided, however, that when the procedures specified in this Part III shall have been initiated, in accordance with the terms hereof, this Part III shall control, and all such jurisdiction shall be transferred to and shall be governed by the procedural and substantive context of this Part III. Any prior action of the Board which might be construed to be inconsistent with the delegation of power hereby made is rescinded to the extent of such inconsistency.

B. PROCEDURE

1. This Part III shall apply to all cases where, in the judgment of the president or his delegate, the chancellor, a student has violated any one or more of the rules established by Section C hereof, and where the president or his delegate, the chancellor, has followed the requirements of this Section B. If a determination has been made as provided in this Paragraph 1, and notice has been served

in accordance with Paragraph 3 hereof, then, and in such event, the provisions of this Part III shall control the case to the exclusion of any other general and academic regulations applicable to any campus of the University.

2. If the president, or the chancellor, has concluded, upon prima facie evidence, that a student has violated one or more of the rules established by Section C hereof, then the president or the chancellor may serve such student with notice that he may be subject to disciplinary action including suspension or expulsion and that a hearing will be held to determine the matter, such notice to be in the form and containing the information required by Paragraph 3 hereof. The chancellor or in his absence his designee may temporarily suspend a student for an interim period pending a disciplinary hearing, such temporary suspension to become immediately effective without prior notice, whenever in his judgment there is evidence of severe misconduct indicating that the continued presence of the student on the University campus poses a threat to University property, to members of the University community, to himself, or to the stability and continuance of normal University functions. A student suspended on an interim basis shall be given the opportunity to promptly appear personally before the chancellor or in his absence his designee and to have a hearing on the following issues only:

(a) the reliability of the information on the student's misconduct, including the matter of his identity;

(b) whether the misconduct and surrounding circumstances reasonably indicate that the removal of the student from the University campus is required to safeguard himself, members of the University community, University property, or the continuance of normal University functions.

This Part III shall become applicable only upon the condition that the president, or his delegate, the chancellor, has invoked the procedures contained in this Part III within ten (10) days after the receipt by the president, or his delegate, the chancellor, of the prima facie evidence required by this paragraph. Unless or until the student has been served with notice in accordance with this Part III, the discipline of any student shall be controlled by the plans for the Undergraduate Judicial System and Graduate Judicial System adopted in 1969, as from time to time amended, or by any other system which has been established in accordance with legally approved standards that may have been or may be adopted for any campus of the University.

3. The procedures and substance of this Part III shall be initiated only upon written notice being served on the student personally or sent to the student involved at his address appearing on the records of the University, by certified mail, advising him of the following (personal service or the receipt by the University of a return receipt of mailing being hereby defined as "service with notice."):

(a) a specific description of the misconduct with which he is charged and a list of those rules in Section C hereof which he has allegedly violated by such misconduct, together with a copy of any written complaint relating to the case;

(b) that he shall be provided a hearing as provided in this Part III not less than four (4) nor more than fourteen (14) calendar days after the effective date of service of notice, such hearing to be held even if he chooses not to appear, and such notice shall specify a date, time and place for the hearing;

(c) that the hearing will be open to the public and press unless he requests that it be closed and its proceedings and decisions considered confidential;

(d) that he shall be permitted to inspect at the office of the chancellor or in some other designated office on campus in advance of the hearing any affidavits, exhibits, or written evidence which the University intends to submit at the hearing;

(e) that he may be accompanied and represented at the hearing by an advisor of his choice, who may be an attorney;

(f) that he shall be permitted to hear the evidence presented against him and that he shall be permitted to question at the hearing any witness who gives evidence against him;

(g) that she shall have the opportunity to present his version at the hearing by way of affidavits, exhibits, and witnesses;

(h) that he has been temporarily suspended from the University, if that be the case; and

(i) if relevant, notice of the possible denial of financial aid pursuant to Section 504 of the Higher Education Amendments of 1968 (P.L. 90-575).

4. A. All Part III cases shall be heard, in the first instance, by a University Judicial Board (the Board).

B. An accused student or the person presenting the case for the University may request of the chancellor the disqualification of any member of the Board selected to serve thereon for the hearing by submitting a letter to the chancellor showing that such member is related or has had a business or close personal association with the accused student, with the complainant, or with any person who has been substantially and adversely affected by the student's alleged conduct. The chancellor may conduct such investigation of the ground for disqualification as he sees fit. The previous participation as a Board member in a hearing involving the accused student shall not be grounds for disqualification. The decision of the chancellor as to whether or not there are sufficient grounds for disqualification is final. If an accused student chooses to invoke the rights conferred by this sub-

paragraph, his hearing before the Board shall be postponed for such period of time (not to exceed seven [7] calendar days) which will enable the chancellor to determine whether the disqualification of any member of the Board is warranted.

C. The Board shall be appointed for each of the campuses of the University by the president or by his delegate, the chancellor. The Board shall be composed of either five (5) or seven (7) members, at the discretion of the appointing authority. One of the members of the Board shall be a member of the administration of the University. The remaining members of the Board shall be equally divided between students and members of the University faculty. Both undergraduates and graduate students shall be represented on the Board at all times. The student members of the Board shall be chosen (if undergraduates) by lot from the members of all existing judicial boards and (if graduate students) by lot from a panel to be maintained by the student members of the Graduate Student Association. The faculty members of the Board shall be chosen by lot from a panel of not less than thirty (30) to be maintained by the senate of the appropriate campus, and in the absence of such list, by the chancellor. The members of the Board shall select the chairman. More than one Board may be established from time to time at the discretion of the appointing authority. A majority vote of the Board shall be sufficient to decide any case that may come before it.

5. The following rules shall apply to any hearing conducted by the Board:

(a) A student shall file with the Board his address to which notice of its decision may be mailed, and the mailing of such decision to such address shall be conclusively presumed to comply with the notification required by the first sentence of Paragraph 10 hereof. All hearings shall be open to the public, but the Board may restrict the number of observers to that which the hearing room may comfortably accommodate. A student appearing before the Board may request that the hearing shall be closed to the public, and this request shall be honored by the Board. Sequestration of witnesses may be ordered. The Board may exclude from the hearing any person, other than the student charged, whose conduct disrupts, disturbs or delays the proceedings. Should the student charged engage in conduct that impedes the progress of the hearing, or makes a fair hearing impossible, the Board may pass an order suspending such student from the University, and such suspension shall thereafter continue until after the hearing, or any adjournment thereof, shall have been concluded and the appeal therefrom, if any, shall have been heard and decided. In addition, the Board may adjourn the proceeding, and in such a case the suspension of such student (whether made by the chancellor in accordance with Paragraph 2 hereof or by the Board in accordance with this subparagraph 5(a)) shall continue until after the conclusion of the adjourned hearing and the time for appeal therefrom has expired.

(b) a pending criminal or civil trial involving the accused student will not be considered grounds for postponement of the disciplinary hearing, unless the date of the judicial trial conflicts with the date of the University hearing.

(c) A student may be represented at a hearing before the Board by an advisor, who may be an attorney. The Board may be asssisted in the conduct of the hearing by a legal advisor (either the director of the Judiciary Office or some other qualified individual).

(d) The student or his advisor shall have the opportunity to question all witnesses, to present witnesses in his own behalf, to present any other evidence, and to make an opening and closing statement.

(e) The person who shall bring the charges under these rules shall be the chancellor or the acting chancellor. Evidence against a student shall be presented by a person designated by the chancellor. The person presenting the case for the University, the University's attorney, and the Board shall have the opportunity to question all witnesses and to present witnesses and evidence relating to the charge specified in the notice.

(f) Formal rules of evidence shall not be applicable to disciplinary hearings, and any evidence or testimony which the Board believes to be relevant to a fair determination of the charges specified in the notice may be admitted. Hearsay evidence or documents not verified may be admitted for the purpose of explaining or corroborating other evidence but shall not be sufficient to support a determination of the truth of the charges unless such hearsay or documentary evidence would be admissible in judicial proceedings.

(g) A student charged under this Part III shall be presumed innocent, and the burden of proof shall be the responsibility of the University. A student charged under this Part III shall not be required to testify before the Board, and his failure or refusal to so testify shall not be construed as an admission against interest.

(h) A full and complete record shall be made of the proceedings before the Board. A recording or other suitable device shall be used. A copy of this record shall be supplied to the student. A student may arrange to have a court stenographer present at his own expense.

(i) Rulings on evidence and all other matters relating to the hearing shall be made by the Board, and such ruling shall be binding upon all parties.

(j) If a student fails to appear for a hearing after having been duly served with notice thereof as required by Paragraph 3 hereof, the hearing shall be adjourned, and in such case the suspension of such student (if the student has been suspended) shall continue until after the conclusion of the adjourned hearing and the appeal therefrom, if any,

shall have been heard and decided. If the Board determines, upon clear and convincing evidence, that the accused student has willfully failed to appear for the hearing, the Board may order the immediate suspension of such student from the University.

(k) If a student leaves the hearing before its conclusion without the permission of the Board, the hearing shall be adjourned, and in such case the suspension of such student (if the student has been suspended) shall continue until after the conclusion of the adjourned hearing and the appeal therefrom, if any, shall have been heard and decided. Withdrawal by a student from the hearing shall be grounds for his temporary suspension from the University by the Board.

(l) Students charged with misconduct arising from a single incident or occurrence may have their hearings joined either at the request of the students involved or at the request of the chancellor. Requests for joint hearings shall be decided by the Board. The Board may sever a student's case from others involved in a joint hearing at any stage in the proceedings, and without affecting the progress of other cases involved, where it appears necessary to insure a fair hearing for all.

6. If a hearing has been adjourned for cause, it shall be rescheduled within ten (10) calendar days from its originally scheduled date. No notice of such adjourned hearing must be given to the student involved, but a reasonable effort to so notify him shall be made. At any adjourned hearing, the rules established in paragraph 4 hereof shall control.

7. The Board shall make its findings based upon substantial evidence produced before it. Such findings shall be contained in a written report which shall be submitted to the chancellor of the campus, within five (5) days of the close of the hearing. The report shall contain:

(a) A finding that the student did or did not commit the acts charged;

(b) If the finding is that the student did commit the acts charged, a further finding that the acts committed did or did not constitute a violation of the rules established in Section C of this Part III;

(c) If the finding is that the student did commit the act charged, and if the student is the recipient of funds under a program enumerated in Section 504(c) of the Higher Education Amendments of 1968 (Public Law 90-575), a further finding as to whether the act was of a serious nature and contributed to a substantial disruption of the administration of the University so as to warrant discontinuance for a period of two years, any further payment to, or for the direct benefit of the student under any of the programs specified in the aforesaid Section 504(c) of the Higher Education Amendments of 1968; and

(d) A penalty, if any, to be imposed.

8. If the Board finds that a penalty should be imposed as provided by paragraph 7(d) hereof, it may invoke the following sanctions:

(a) disciplinary reprimand, or
(b) conduction probation, or
(c) dismissal from University housing, or
(d) disciplinary probation, or
(e) suspension from the University, or
(f) explusion from the University.

If the Board imposes the sanctions provided by sub-paragraphs (a) to (d) of this paragraph, then the prior suspension of the accused student, if any, shall be lifted, and the continued discipline of the student shall be as provided in the order of the Board. If the Board finds the accused student innocent of the offense with which he was charged, his temporary suspension, if any, shall be lifted. In all cases where a temporary suspension has been lifted, the student shall be given an opportunity to complete interrupted academic work. In invoking the power to sanction a student as provided hereby, the Board may consider any prior disciplinary action taken against the student involved.

9. In the event that the Board shall fail to submit a report to the chancellor of its findings and recommendations within seven (7) calendar days after the close of the hearing, then the chancellor shall promptly give notice to the accused student and appoint another University Judicial Board as required by these rules, and thereafter a new hearing shall be held by such successor Board, all in accordance with the rules contained in this Part III.

10. Within ten (10) calendar days after notice of the Board's decision the student may appeal that decision. If no such appeal is taken, the order of the Board shall be final and conclusive. Such appeal shall be noted by filing a written request therefor with the chancellor which shall state the grounds upon which the appeal is taken and shall also state the address of the appellant, which address shall be used by the appellate agency for the service of notice as required by Paragraph 11 hereof. If the student shall have been suspended, any such appeal shall continue that suspension, notwithstanding the sanctions, if any, imposed by the Board as provided by Paragraph 8 hereof. The student charged shall have the option to appeal either to:

(a) the chancellor of the campus, or
(b) the president of the University, or
(c) an arbitrator as provided for by Paragraph 12 hereof.

11. All appeals, as provided by Paragraph 10 hereof, shall be taken upon the record made before the Board. No testimony or other evidence shall be introduced before the appellate officer. However, the parties may submit written briefs stating their contentions concerning the case and may be represented before the appellate officer by a representative or legal counsel who may present oral arguments on their behalf. The appeal shall be heard within fourteen (14) days after it

has been noted in accordance with Paragraph 10 hereof. The student-appellant shall be sent a notice of the time and place for the hearing of the appeal; the requirement of notification contained in this paragraph shall be satisfied by the mailing thereof to the student-appellant at his address shown on his notice of appeal as required by Paragraph 10 hereof. The appellate officer may affirm, modify, revise or reverse the decision of the Board, or he may remand the case to the Board for further proceedings not inconsistent with its findings, but it may not increase the sanctions imposed by the Board. The decision of the appellate officer shall be made in writing; it shall be made within ten (10) days after he has heard the case; his decision shall be final and binding upon the parties; the decision shall be communicated in writing to the accused student by the appellate officer and to the parents or legal guardians of the student if he is under the age of twenty-one (21) years.

12. The accused student may appeal the decision of the Board to an impartial arbitrator appointed directly by the National Center for Dispute Settlement of the American Arbitration Association (NCDS). Such appointment may be challenged by either party for good cause. The NCDS shall decide the question of good cause. In addition to the requirements of Paragraph 10 hereof, the student shall initiate the arbitration by mailing or delivering in person two copies of a notice of a desire to arbitrate to the National Center for Dispute Settlement, 1815 H Street, NW, Washington, D.C. 20006, which notice shall constitute a contract on behalf of the student that he shall be bound thereafter by the decision of the National Center for Dispute Settlement. The arbitration shall be conducted in accordance with the Community Dispute Settlement Rules of the National Center for Dispute Settlement to the extent such rules are not inconsistent with the provisions of these rules. Where any such inconsistency may exist, these rules shall be controlling. Questions of such inconsistency shall be decided by the arbitrator. The costs of the arbitration proceeding shall be borne equally by the student and the University. A student who is unable to pay his share of these costs may petition the University to bear the whole cost of the arbitration, provided that the petition plus supporting documents is submitted to the chancellor for his decision prior to the filing of a notice of a desire to arbitrate.

C. DISCIPLINARY RULES

1. The disciplinary rules contained in this section C are the rules which may invoke the procedures stated in section B hereof.

(a) Violation of fire regulations, failure to comply with evacuation procedures, tampering with fire-protection apparatus, use of fireworks, or use of open-flame devices or combustible materials which endangers the safety or well-being of the University community; or unauthorized use of electrical equipment.

(b) Unauthorized entry into or presence in a University building or facility. Except for properly scheduled use, classroom, administration and recreation buildings are closed to general student use on holidays, Saturday afternnon, Sundays and after 12 midnight during the week. Students may use a building or facility for a specified purpose upon written permission from a member of the faculty with approval of the academic or administrative officer normally having control over such building or facility, which permission may be revoked or withdrawn.

(c) Obstruction of, disruption of, or interference with any University activity of an academic nature; actions on the part of students which substantially obstruct, disrupt or interfere with non-academic activities on University premises by members or authorized non-members of the University community.

(d) Destruction, theft, attempted theft, or impalrment of University property.

(e) Behavior which jeopardizes the safety or well-being of other members of the University community, or persons coming onto University property; physical harrassment of, or interference with firemen, policemen or other persons engaged in the performance of their official duties; physical abuse or threatening physical abuse of any person on University property; forcible detention of any person on University property.

(f) Possession, use, sale or distribution on or in University property of illegal drugs or of drugs for which the required prescription has not been obtained.

(g) The possession or use of bombs or explosive devices of any character; the threat, either made orally or in writing, that any bomb or explosive device has been or may be implanted in or upon any property or building of the University.

PART IV—CAMPUS TRAFFIC RULES AND REGULATIONS

These regulations apply to all who drive motor vehicles on any part of the campus at College Park.

1. PURPOSE OF TRAFFIC REGULATIONS

a. To facilitate the work of the University by providing parking space for those who need it most.
b. To provide parking space for University visitors and guests.
c. To protect pedestrian traffic.
d. To assure access at all times for ambulance and fire-fighting apparatus.
e. To control vehicular traffic on the Campus.

2. REGISTRATION OF VEHICLES:

a. All motor vehicles, including motorcycles and scooters, operated on campus by a person associated with the University, must

be registered with the University Motor Vehicle Registration Office regardless of ownership, except as noted in Regulation 2c. All student vehicles must be registered in the name of the student who is the legal operator of the vehicle.

b. Student vehicles must be registered for the current academic year during the applicable registration period. A registration charge will be made for each vehicle. This charge will be in the amount of ten ($10.00) dollars during the period September 1 thru March 31 and five ($5.00) dollars during the period April 1 thru August 31 for the first vehicle. Additional vehicles may be registered for a charge of $2.00 each during the period September 1 thru March 31 and $1.00 each during the period April 1 thru August 31. Proof of ownership or legal control will be required for multiple registrations. Students applying for registration of additional vehicles must present the state vehicle license number and the University of Maryland registration number of their initially registered vehicle for the current academic year. This charge cannot be refunded. No charge will be made for replacement registration stickers required due to damaged bumpers of a registered vehicle or because of purchase of a replacement for a registered vehicle. Remnants of stickers to be replaced must be turned in at the Motor Vehicle Registration Desk.

c. Resident students who have completed less than 56 semester credits shall be prohibited from operating a motor vehicle on the College Park campus, and from registering a vehicle under provisions of these regulations, except for special weekend privileges as provided in regulation 2d. This prohibition applies to any freshman or sophomore student residing within one (1) mile radius of the Library, providing said residence is other than that shown as student's legal residence at time of registration.

d. Resident students who have earned less than 56 semester credits are permitted to operate a motor vehicle on the College Park campus during the hours from 5:00 P.M. Friday to 12 midnight Sunday only. Vehicles operated on the campus under provisions of this regulation must be registered in accordance with regulations 2a and 2b. Special "weekend" registration stickers will be issued. Vehicles displaying weekend stickers will be considered not registered if observed on the campus at any time other than the specified weekend period.

e. Parking permits for faculty and staff are issued initially at the time of employment. Subsequent renewals will be scheduled at times designated by the Police Department.

f. Only one set of parking permits for each vehicle is authorized.

g. Vehicles are not considered officialy registered until permits are affixed on front and rear bumpers.

h. Temporary parking permits for visiting groups and for special reasons and conditions are available. Request should be made to the Motor Vehicle Registration Desk—Telephone Ext. 4242.

i. Parking permits must not be transferred to any vehicle other than the one for which they were originally issued.

j. Parking permits must not be defaced or altered in any manner.

3. TRAFFIC REGULATIONS:

a. All motor vehicles are subject to University traffic regulations while on the University campus. The University assumes no responsibility for loss or damage to private property.

b. All traffic and parking signs must be obeyed.

c. It is impossible to mark with signs all areas of University property where parking is prohibited. Parking or driving is definitely prohibited on grass plots, tree plots, construction areas, or any place which will mar the landscaping of the campus, create a safety hazard or interfere with the use of University facilities.

d. All regulations must be observed during registration and examination periods, except as may be otherwise indicated by official signs. During final examination periods and the Summer School session, registered vehicles may park in any numbered parking area except Areas 5, 6, and 9.

e. Operation of any motor vehicles in such a manner as to create excessive noise or smoke, or operation of any vehicle which is in an unsafe condition, will result in revocation of parking permit and issuance of a Maryland State Summons for violation of Article 66½ Annotated Code of Maryland.

f. Pedestrians shall have the right-of-way at all times.

g. The maximum speed on campus roads is 20 miles per hour. During changes of classes and in areas of pedestrian traffic cars must be driven more slowly.

h. Vehicles, including motorcycles and motor scooters, must be parked in assigned areas only. Certain parking areas are restricted to faculty and academic staff at all times. This restriction is indicated on the official sign at the entrance to the area. In all other parking areas, unrestricted parking for any vehicle registered on the campus is permitted from 5:00 p.m. to 12:00 midnight, Monday thru Thursday; and from 5:00 p.m. Friday to 12:00 midnight Sunday.

i. Any motor vehicle parked in violation of University traffic regulations or abandoned on campus is subject to removal and impounding at the expense of the owner or operator. (See Regulation 4c.)

j. Specific spaces in parking areas shall not be reserved or marked for any department or individual.

k. If an unregistered vehicle is used as an emergency substitute for a registered vehicle, it must be parked in the regularly assigned area and an immediate report made to the Motor Vehicle Registration section Ext. 4242.

l. In parking areas which have marked spaces and lanes, a vehicle must be parked in one space only, leaving clear access to adjacent spaces, and without blocking driving lanes or creating a hazard for other drivers.

m. Parking is not permitted at crosswalks.

n. Parking or standing is prohibited on all campus roads at all times.

o. In cases where individuals are permitted to register more than one vehicle for parking on the campus, only one of these vehicles may be parked in the assigned area at any time.

p. Metered parking spaces must be used in accordance with requirements as stated on official signs.

q. Curbed recesses are reserved for VISITORS and GUESTS between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday.

r. The fact that a vehicle is parked in violation of any regulation and does not receive a violation notice does not mean that the regulation is no longer in effect.

4. TRAFFIC INFORMATION:

a. The Office of the University Police is located in the Service Building and may be reached on University campus telephone Ext. 3555.

b. The Vehicle Registration Office is in the Service Building, campus telephone Ext. 4242.

c. The term abandonment, as it relates to automobiles parked on property owned or leased by the University of Maryland, shall mean any one or more of the following conditions:

(1) Any vehicle which has not been moved for thirty (30) days and whose owner or other claimant the University is unable to locate.

(2) Any vehicle which has not been moved for thirty (30) days and whose identified owner or other claimant refuses to move it.

(3) Any vehicle on which current license plates are not displayed and which has not been moved for ten (10) days.

(4) Any vehicle which has not been moved in seven (7) days due to an inoperative condition caused by the removal of necessary parts or a wrecked condition.

5. PENALTIES

a. Any person connected with the University who operates an unregistered vehicle on the campus, or who registers such a vehicle in any way contrary to the provisions of these regulations, will be subject to payment of a fifteen ($15.00) dollar penalty in addition to the penalty for any other regulation violation connected therewith.

b. Violations of any campus traffic regulation other than improper registration or overtime meter parking will result in penalty of five ($5.00) dollars for each violation.

c. Overtime parking in an metered space will result in penalty of one ($1.00) dollar for each hour the violation occurs.

d. Violations are payable within ten (10) calendar days from date of issue at the office of Vehicle Registration in the General Services Building and an additional penalty of $2.00 will be imposed for failure to settle violations on time.

e. Visitors and Guests notices issued to University visitors must be signed and returned either in person or by mail to the Cashier, Motor Vehicle Registration Office, University of Maryland, College Park, Md. 20740, or to the University official visited. The violation may be voided at the discretion of the University Police, and if not voidable will be returned for payment.

f. Violations involving an unregistered vehicle owned by a member of the immediate family of a student may be charged to the student's account unless settled by the individual receiving the ticket, in accordance with stated privileges granted to visitors and guests.

g. Motor Vehicle privileges will be revoked by action of the Vehicle Registration Office in accordance with the following conditions:

(1) When a student has accumulated at least three (3) violations on the record, he (she) will lose motor vehicle privileges for a period of four (4) weeks.

(2) When a student has accumulated an additional two (2) violations on the record for a total of five (5), he (she) will lose motor vehicle privileges for a period of sixteen (16) weeks.

(3) In each case the student will be required to remove the registration stickers and turn in remnants of the stickers to the Motor Vehicle Registration Section.

(4) When the prescribed period of time for loss of motor vehicle privileges has

passed, the student will be required to pay the regular fee for re-registration.

(5) All conditions described in Items 1, 2, 3, and 4 apply to all vehicles registered by any student.

h. Persistent violators of traffic regulations will be referred to the Judiciary Office for appropriate action.

6. APPEALS

An Appeals Board composed of a minimum of three students who are members of the Student Traffic Board meets regularly to consider appeals from students charged with violations. Students wishing to appeal a violation will first register his intent to appeal to the Vehicle Registration Office in the Service Building, thence to the Judiciary Office, Room 218, North Administration Building where the date and time for the appeal will be furnished the appellate. Traffic tickets must be appealed within (10) calendar days from the date of issuance. Overtime parking meter violations are not subject to appeal.

7. PARKING AREAS FOR STUDENTS:

Area 1—West of Activities Building between Stadium Drive and Campus Drive
Area 2—North of Denton Hill Dorm Complex
Area 3—Southwest Corner of Campus
Area 4—North of Heavy Research Laboratory
Area 7—East of U.S. No. 1, at North Gate
Area 10—East of U.S. No. 1, North of Fraternity Row
Area 11—East of Asphalt Institute Building

8. PARKING AREAS FOR FACULTY, STAFF AND ASSIGNED RESIDENT STUDENTS ONLY:

Area 5—Adjacent to Family Housing Units
Area 6—North of Dining Hall No. 5 and East of Elkton Dorm
Area 9—Vicinity of Cambridge Hall Dorm Complex
Area 12—South of Allegany Hall
Area 14—Loop Roads Front and Rear of Houses on Fraternity Row
Area 15—Rear 7402 Princeton Avenue
Area 17—Special Parking for use of Center for Adult Education
Area A—West End of BPA Building
Area AA—West of Fine Arts and Education Classroom Building
Area B—Adjacent to Computer Science Center
Area BB—East end of practice field
Area C—Adjacent to Turner Laboratory (Dairy)
Area CC—Barn area
Area D—Rear of Journalism Building
Area DD—East of Space Sciences Building
Area E—Adjacent to Engineering Buildings
Area EE—North of Engineering Laboratory Building
Area F—Adjacent to Fire Service Extension Building
Area FF—East of Animal Science Building
Area G—Between Silvester Hall and Skinner Building
Area GG—North of Adult Education Center Building
Area H—Adjacent to Symons Hall and Holzapfel Hall
Area HH—Adjacent to H. J. Patterson Hall
Area I—Rear of Molecular Physics Building
Area J—West of Annapolis Hall
Area K—Adjacent to General Service Building
Area KK—Southeast corner of Stadium and Regents Drive
Area L—Administration-Armory Loop
Area M—Adjacent to Infirmary
Area N—Rear of J. M. Patterson Hall
Area O—Rear of Chemical Engineering Building
Area P—Southwest of Wind Tunnel Building
Area PP—Between Math and Chemistry Buildings
Area Q—Rear of Jull Hall
Area OO—Zool.-Psychology Bldg.
Area R—Circle in front of Administration Building at Byrd Stadium and adjacent to Preinkert Field House
Area S—Special, Food Service
Area T—North of Engineering Laboratory Building
Area TT—Service Area West of Physics Building
Area U—Rear of McKeldin Library
Area UU—North end 3 Lot
Area V—Open area between Building DD and Building EE
Area W—Between Skinner Building and Taliaferro Hall
Area X—Rear of Chemistry Building
Area XX—West—New Chemistry Wing
Area Y—West of Chapel
Area YY—West of Cumberland Hall
Area Z—Adjacent to East Entrance to Parking Area No. 1

PART V—SELECTED POLICY STATEMENTS

POLICY ON AMPLIFYING EQUIPMENT

1. Public address systems, loudspeakers and other forms of sound amplifying equipment may be used in any of the following outdoor areas of the campus:
   a. Physical education and intramural field between University Boulevard and parking area 1.
   b. North Mall between Campus Drive and Washington-Baltimore Boulevard.
   c. South Mall between Regents Drive and Washington-Baltimore Boulevard.
   d. Athletic practice fields east of Byrd Stadium.

2. The use of public address systems, loudspeakers and other forms of sound amplifying equipment must be restricted in the Central Mall area between 8 a.m. and 6 p.m. on class days in order to minimize the likelihood of disturbing classes and other academic activities. However, such equipment may be used in the Central Mall during these hours if the procedures outlined below are followed. All equipment used in Central Mall must be secured through the Office of the Director of the Physical Plant or through the S.G.A. office.
   a. Public address systems, loudspeakers and other forms of sound amplifying equipment (except in "b" below), must be secured from the Office of the Director of Physical Plant, South Administration Building, by requesting such equipment in writing at least twelve (12) hours in advance. Any University student or organization which fulfills the following requirements will be permitted to use the amplifying equipment.
      (1) An individual must be currently enrolled as a student, part-time or full-time, at the University or currently employed by the University.
      (2) Any organization or activity must have been recognized by the SGA Legislature and must at the time of the request have official recognition as a University organization or activity.
   b. Bullhorns will be available upon surrender of the I.D. card in the SGA office and in the Office of the Director of the Physical Plant. Bullhorns secured in this manner may be used on the Central Mall without prior permission. Any individual may use only one bullhorn at a time.
3. Public address systems, loudspeakers and other forms of sound amplifying equipment may be used in outdoor areas of the campus other than those listed above (sections 1 and 2) by securing approval in writing at least 5 days in advance from the Facilities Use Committee by application to the Office of the Director of the Physical Plant. Approval will be granted for use of amplifying equipment in these areas only if there is a high probability that the planned activity will not disrupt or disturb other University activities or if the area has not been previously reserved. Permission will be granted to use amplifying equipment in the vicinity of residence halls only upon specific written request of the student government of the residence halls affected.
4. Individual students or organizational representatives using amplifying equipment must accept responsibility for any complaints of disturbances or disruption received from persons in University academic and/or residence buildings.

POLICY ON DEMONSTRATIONS

I. GENERAL STATEMENT

a. The University of Maryland cherishes the right of individual students or student groups to dissent and to demonstrate, provided such demonstrations do not disrupt normal campus activities, or infringe upon the rights of others.
b. On the other hand, the University will not condone behavior which violates the freedom of speech, choice, assembly, or movement of other individuals or groups. In short, responsible dissent carries with it a sensitivity for the civil rights of others.
c. Accordingly, the University will take whatever steps it deems necessary to (1) protect the right of any individual or group to demonstrate and publicly proclaim any view, however unpopular; (2) protect the freedom of speech, assembly and movement of any individual or group which is the object of demonstrations.

To achieve the foregoing objectives the following guidelines have been developed for operation at College Park:

II. GUIDELINES FOR GENERAL DEMONSTRATIONS

a. Unscheduled demonstrations, "teach-ins," rallies, or equivalent activities may be held by recognized university organizations and activities, full or part-time students, and current employees of the University in the areas defined below provided that the activity does not interfere with any function for which that space has been reserved in advance.
   1. The Central Mall
   2. Physical education and intramural field between University Boulevard and parking area 1.
   3. Athletic practice fields east of Byrd Stadium
   4. North Mall between Campus Drive and Washington-Boulevard Boulevard.
   5. South Mall between Regents Drive and Washington-Baltimore Boulevard.

   All activities in these areas must be conducted so as to avoid interference with the regularly scheduled functions of the library and/or classrooms adjacent to the area and in compliance with the provisions contained in IIg, 1-8.

   Failure to reserve space will not invalidate the privilege of conducting the appropriate activity. However, in the event of two or more groups desiring to use a given space, an approved space reservation will take precedence over an unscheduled activity. If two or more groups desire a space when no reservation has been made, the first come, first served principle will apply.

b. Recognized University organizations and activities, full or part-time students, and current employees of the University who wish to schedule a demonstration, "teach-in," rally, or equivalent activity, may request the space through the facilities reservation procedure up to 24 hours in advance. Demonstrations will be permitted in the locations outlined in IIa. above unless the space has previously been reserved or is in use for academic activities or intercollegiate athletic team practices. Demonstrations may be held at other locations on the campus subject to approval by the Vice Chancellor for Student Affairs in consultation with the Student Life Committee. Students who participate in demonstrations which have not been approved may be considered in violation of University policy. (Except as provided in IIa. above.)

c. Demonstrations, rallies or "teach-ins" may be conducted in or adjacent to any residential building with the specific written concurrence of the student government of the unit or area concerned. Any such rallies, demonstrations or "teach-ins" which may be authorized by the appropriate student government must conform to the general procedures contained in IIg. 1-8.

d. Demonstrations in the form of parades on streets may be conducted with the specific approval of route and time secured 48 hours in advance from the University Public Safety and Security Office.

e. Although groups may sponsor or organize demonstrations, rallies, "teach-ins," or picketing activities, the fact of groups sponsorship or organization in no way relieves individuals of the responsibility for their own conduct, and each individual participating in such activities is accountable for compliance with the provisions of this policy.

f. Persons not members of the University student body, faculty or staff may participate in demonstrations, rallies, picketing, teach-ins or equivalent activities only upon invitation by a bonafide student, faculty or staff member. All non-students are obligated to the terms of this policy during participation in such activities. Since persons not students, faculty or staff members are not subject to University discipline procedures, failure to comply with terms of this policy may result in action under terms of appropriate Maryland law.

g. In addition to the above provisions, the following guidelines will apply to all demonstrations.

1. Reasonable access to and exit from any office or building must be maintained. The right of way on public streets and sidewalks will be maintained.
2. Demonstrators will not attempt to force the cancellation or interruption of any event sponsored by a University office or by a faculty or student group or by any group authorized to use University facilities.
3. Classes or other educational activities in classroom buildings and the library will not be disrupted.
4. The use of public address systems, loudspeakers, etc., in the vicinity of academic and residence buildings will follow procedures set forth above.
5. Demonstrations may be carried on inside of University buildings only as provided in Sections IIc and 4 or with approval of the Facilities Use Committee as outlined in the University General and Academic Regulations.
6. Where an invited speaker is the object of protest, students and faculty may demonstrate OUTSIDE the building where the lecture will take place. Demonstrators who wish to enter the building must do so as members of the audience and must give the speaker a respectful hearing. Signs, placards or other paraphernalia associated with a demonstration will not be carried into the building.
7. University property must be protected at all times.
8. The safety and well being of members of the University community collectively and individually must be protected at all times.

h. Complaints received from users of the Library or classrooms adjacent to the defined areas (IIa.) will be grounds for disciplinary action against individuals and/or groups sponsoring or participating in rallies, "teach-ins" or demonstrations in these areas.

III. GUIDELINES FOR DEMONSTRATIONS IN CONNECTION WITH PLACEMENT PROGRAMS

a. Anyone wishing to question or protest the on-campus presence of any recruiting organization should contact the Director of Placement or his representative in advance.

b. Should any member of the University Community wish to discuss or protest the *internal policies* of any recruiting organization, the Director of Placement must be contacted for assistance in communicating directly with the appropriate representatives of said organization.

c. Demonstration guidelines outlined in Section IIg. 1-8 are applicable.

d. Demonstrations in conjunction with placement programs conducted in the Placement Service's Cumberland Hall facility or other facility shall be considered not to infringe upon the rights of others and the normal functioning of placement programs provided that demonstrations are conducted outside of the facility and do not interfere with free and open access to Placement and Credentials Services facilities by those students, faculty, staff, and visitors who wish to conduct business within the framework of established placement programs.

IV. SPECIAL GUIDELINE PERTAINING TO THE STUDENT UNION

a. No demonstrations, rallies, "teach-ins" or equivalent activities may be held in the lobbies or corridors of the Student Union.
b. Demonstrations may be held in assigned rooms of the Student Union by recognized student organizations following procedures for reserving space which have been outlined by the Student Union Board.

V. GUIDELINES FOR PICKETING

a. Legal Rights and Limitations.
Orderly picketing is a legally established form of expression which recognizes the individual's right of free expression subject only to such reasonable limitations as are imposed by state legislation and University regulations. These limitations are intended to protect the rights of the picketer, the student body and the public with particular concern for safety, preservation of normal academic life and order, and the protection of persons and property.
b. Conduct of Picketers.
1. Picketers are subject to those regulations listed above in Section II, g, 1-8.
2. Picketers will not disrupt any University activity by making excessive noise in the vicinity of any University building.
3. The University Health Service is off-limits to picketers because special silence and other Welfare and safety factors are involved.

ALCOHOLIC BEVERAGE POLICY AND PROCEDURES

POLICY

Regulations forbid unauthorized possession, use or distribution of alcoholic beverages on or in University property. University policy is consistent with State and County laws and restricts ON-CAMPUS use of alcoholic beverages in specified areas.

Interpretation

1. *Age*—Students under 21 years of age may not possess, consume or distribute alcoholic beverages.
2. *LICENSING*—At this time Prince George's County will not authorize a temporary license to any student organization. This refusal is based on the impossibility of ascertaining that all members of the student organization are citizens over 21 years of age. The present policy, in fact, means that:
   a. Individual drinking (individuals over 21) is no problem.
   b. Events of a "Bring Your Own Bottle" nature are possible.
   c. Events where alcoholic beverages are dispensed free to anyone over 21 are possible.
   d. Events where donations are asked for alcoholic beverages are possible, when the donations are voluntary. (CAUTION: the providers of the beverage may in no way force a donation.)
   e. Events dispensing alcoholic beverages *for profit* are prohibited. There may not be direct sale of liquor without a license, nor may there be an admission charge for the event.
3. *RESTRICTED AREAS*—Alcoholic beverages may not be possessed, consumed or distributed in any academic facility, except where specific, written approval has been obtained for the event from the individual or department responsible for the operation of that facility. This restriction applies to all dining halls, cafeterias, classroom and office buildings, libraries, laboratories, administrative buildings, and athletic facilities.

When planning an event where alcoholic beverages will be brought in by the individual consumers, or will be given away, or where donations will be invited, the following procedures should be followed:

1. Receive written approval for the use of your facility—in the residence areas check for any local restrictions established by unit governments.
2. Secure and complete the *Registration Of A Student Social Event* form in the Student Activities Office. (Rm. 142, Student Union).
3. Secure and complete the *Alcoholic Beverage Registration* form which names the person responsible for the event.

STUDENT ACTIVITIES

The Student Activities Department is concerned with facilitating learning and personal growth in the widest sense for all students. To this end, its professional staff has made a team commitment to designing a broad spectrum of experiences relevant to the current lives, goals, and needs of students.

As they move into the seventies, the members of the Department are concentrating their energy on becoming consultants and resource people to the University community in all aspects of co-curricular experiences. They will focus their programs on leadership, communications, group tech-

niques and human relations skills. To establish an environment emphasizing creativity, innovation and improvement in their programs, they are increasingly involving themselves with in-service staff development seminars.

The success of their programs in this decade will depend critically on the ability to involve students in the entire process of planning, implementation and evaluation of the programs. The Department invites the entire University community to become involved with them in creating a better total educational experience for the students of the University of Maryland.

In summary, then the Student Activities Department is involved with:

STUDENTS VOLUNTEERING their services in community projects in Maryland and Washington, D.C. through their organization, PACE—People Active in Community Effort.

STUDENTS SPONSORING orientation programs for freshmen, transfer students and parents; working in small groups to develop a sense of community among new students.

STUDENTS SHARING their attitudes and feelings in small group seminars on topics such as sex, drugs, racism, women's roles in society and human relations.

STUDENTS EXPLORING different techniques of leadership and communication through special small group labs.

STUDENTS ORGANIZING to create their own communities of special interest through 250 campus organizations including the University Commuters Association, Black Student Union, Greeks, Free University, and a broad range of political, social, academic and religious associations.

STUDENTS WORKING to help bring creative talents to the world's great artists to the campus in special cultural events.

STAFF PROVIDING RESOURCES to individuals, groups and campus organizations to help them organize, participate and communicate in relevant experiences outside the classroom.

STAFF CONSULTING with all segments of the University community towards planning a better University meeting the need of students in the '70's.

The Student Activities Staff can be contacted in Room 136 through Room 142 in the Student Union or by calling 454-2827.

RECOGNIZED ORGANIZATIONS AND ACTIVITIES

Two types of student organizations are eligible for recognition. The are (1) Recognized Organizations and (2) Recognized Activities.

1. Recognized Organizations
   A. A group of students may organize by filing a constitution for recognition by SGA.
   B. Recognized organizations may file for use of SGA funds.
2. Recognized Activities
   A. A group of students may form an activity without filing for constitutional approval from SGA.
   B. An activity need merely file for recognition by SGA, submitting the purpose of the activity, its name, and responsible students and/or faculty.
   C. An activity is not eligible for SGA funds.
   D. Activities may be short-term organizations.
   E. Activities may be composed of students who want to organize informally.
   F. Responsibilities of activities are the same as those of organizations, under the General Regulations. In addition, a nondiscrimination statement must be filed with the Director of Student Activities before recognition is granted.

Recognized organizations, activities and other groups may use Student Union facilities when space is available. The priority for use of available space will be in descending order: recognized organizations, recognized activities and other groups.

REGISTRATION OF UNIVERSITY EVENTS

ON-CAMPUS UNIVERSITY EVENTS

The primary purpose of registration of on-campus university events is to facilitate the use of University facilities and better coordinate the University calendar. Thus, the only on-campus events which must be registered are those which require the use of facilities which have to be reserved through the Physical Plant Office. In these cases events must be registered with both the Activities Coordinator, Office of Student Activities (Rm. 142, Student Union Building) and the Physical Plant Office (South Administration Building).

OFF-CAMPUS UNIVERSITY EVENTS

Broad invitational University-sponsored events held off-campus, such as class proms, must be registered with the Activities Coordinator (Rm. 142, Student Union Building).

All events both on and off-campus where there will be alcohol must be registered with the Activities Coordinator. (See following section.)

NOTE: A staff member (or members) are required at all registered social events. This staff member may be from the University Housing Office, a faculty member or graduate assistant or a member of the administration. Parents of students may also serve in this capacity.

PROCEDURES FOR SCHEDULING LARGE EVENTS

Register date on calendar in the Office of the Activities Coordinator (Room 142, Student Union Building).

Read the section of Academic Regulations relating to Social Functions, Reservation of Space and Advertising.

Reserve a room and arrange for its physical set-up through the Office of the Department of Physical Plant, South Administration Building (if held on campus). In some cases the room or building must first be cleared by the person in charge of that building.

Cole Activities Building
Armory
Ritchie Coliseum
Maryland Room
Chapel

After this first approval, however, final approval must still be obtained from the Office of the Department of Physical Plant, South Administration Building.

FUND-RAISING EVENTS REGISTRATION

The policy concerning money-making events of a "Presents" nature (presentation of professional talent) is currently undergoing review. The revised policy will be available from the Director of Cultural Affairs.

UNIVERSITY INFORMATION CENTER

The University Information Center is operated by the Student Activities Department to provide information about University programs, services and facilities.

The Center is open from 10:00 a.m. to 4:00 p.m. Monday through Friday and is located in the Student Union Main Lobby, Room 111.

STUDENT PUBLICATIONS

Students publications produced regularly include the Diamondback, Terrapin, Calvert Review, Argus, The Greek, and the Course Guide.

Any publication or pamphlet published by a student organization or group must be approved in advance by the Adjunct Senate Committee on Student Publications and Communications.

REGISTRATION OF UNIVERSITY EVENTS

The Activities Coordinator (Rm. 142 Student Union) is responsible for the registration of certain University events.

NEW STUDENT ORGANIZATIONS

Any student or group wishing to organize a University-recognized club or activity should obtain a copy of the Student Organizations Directory which explains the procedure for formal recognition by the Student Government Association and the Adjunct Committee on Student Activities of the University Senate. Members of the Student Activities staff are available to talk with the students about organizations.

STUDENT UNION

The Union is the focal point of cultural and social activity for the University. Its purpose is to provide the University family with programs and facilities to satisfy a variety of out-of-classroom tastes and needs. The activities and services of the Union are for the convenience and enjoyment of all members of the University community whether participating in meetings, lectures, dances, receptions, films, bowling, or simply relaxing over a cup of coffee in casual conversation with friends.

The Student Union is a division of the Office of the Vice Chancellor for Student Affairs.

All activities in the Student Union are coordinated through the staff offices, Rooms 131-135, on the first floor. Any information on any phase of Student Union facilities, services or activities can be obtained by contacting the Student Union staff.

No solicitations nor sales are permitted in the building.

BUILDING HOURS:

Monday-Thursday—7:00 a.m.-11:00 p.m.
Friday-Saturday—7:00 a.m.-12 midnight
Sunday—12 noon-11:00 p.m.

AMUSEMENTS

The sub-basement is the amusement center of the Student Union and is completely air-conditioned, attractively decorated, and is furnished with all the conveniences of a modern commercial establishment.

During building hours, the sub-basement offers 16 tenpin lanes, 12 pocket billiard tables, bowling and billiard accessories, lockers, vending machines, pinball machines, bank, and shuffleboard, as well as bridge, table tennis, and chess tournaments.

Every weekend during the school year an entertainment film program is offered. The Union tries to program the most current entertainment films. On Tuesday is the Concert Film Series which includes classical, foreign, experimental, educational, student, and entertainment films. The Student Union Board calendar lists the films for the current semester.

During the two-year period from June 1970 through the Fall Semester of 1972 as the addition to the Union is being completed, changes will be seen. The Union will double in size and many new services will be offered.

SERVICES, FACILITIES AND EQUIPMENT

1. Information Desk.
2. Bulletin Boards—all notices must be dated at Main Desk.
3. Check Cashing—personal checks cashed: maximum $20 (personal) and $40 (payroll)—identification required—25 cent service charge.
4. Conference rooms.
5. Display showcases.
6. Duplicating services—mimeograph, ditto, offset printing, letterpress signs, plastic signs.
7. Notary Public—this service is provided free of charge to the University community.
8. Piano practice rooms—a key may be obtained at the Main Desk on I.D. card exchange.
9. Ride Board—to relieve congestion of bulle-

tin boards, all ride information is to be posted on the ride boards and not on the other bulletin boards.
10. Telephones—campus and pay phones.
11. Television Room.
12. Ticket Office—tickets to various campus events and selected off-campus activities.
13. Lounges.
14. Smoke Shop.
15. Food Service—cafeteria and snack bar.
16. Catering—telephone extension 2805.
17. Ballroom—for movies, large dinners, dances, and meetings.
18. Reservations—all facilities, at main desk.
19. Student Supply Store—sells a variety of miscellaneous items as well as all books and materials needed for clases. During the construction, the Student Supply Store will operate in Room 112, formerly the main lounge, and the Student Supply Store Annex on the north side of the campus by the Cambridge Complex. The store offices will be in Room 112-A.
Store Hours: Monday-Friday 8:35 a.m.-4:15 p.m.
20. Staff officer, Department of Student Activities.
21. Student Government Association officer.
22. Bowling lanes and billiard room.

Listed below are some of the facilities being added in the new addition:

1. New billiard room.
2. New table game room.
3. A 750-seat commercial style movie theater.
4. Vending machine dining room.
5. Expanded food service area.
6. Additional meeting rooms.
7. New ticket office.
8. Full-service branch bank.
9. New tobacco shop.
10. New ballroom.
11. Additional student office space.

SPACE RESERVATIONS FOR UNIVERSITY FACILITIES

University space and supporting service facilities are in constant demand by many people and organizations. This requires regulations that will provide a fair assignment of available resources (space). The Facilities Use Committee administers space and supporting services.

For referral to proper authorities for coordination of requests, call campus telephone extension 2233.

FRATERNITY RUSH REGULATIONS

1. Pledging Requirements
   a. Any full-time male undergraduate student who is in good academic standing with the University may pledge
   b. An individual may pledge only two consecutive semesters. If after these two semesters a pledge does not meet the academic requirements for initiation, he shall be dropped from the fraternity roll. Repledging may occur only after he has achieved at least a 2.0 cumulative average.
   c. Any individual who is formally pledged to a fraternity and who elects to depledge will not be eligible to pledge another fraternity until one full semester has elapsed from the date of his depledging.
   d. Any individual who is depledged by a fraternity is immediately eligible for pledging into another fraternity provided he meets all other requirements.
2. Initiation Requirements
   a. Any pledge who, at the time of pledging, had a cumulative average of 2.0 or above may be initiated after ten academic weeks of pledging.
   b. Any student pledged with less than a 2.0 cumulative average must attain at least a 2.0 average during the semester he pledges.

SORORITY RUSH REGULATIONS

1. Pledging Requirements
   a. To pledge a sorority, a girl must have at least a 2.2 numerical grade average from high school, be enrolled in the University, pay the rush fee during formal rush, not be on probation, and not be affiliated with any National Panhellenic sorority.
   b. If a girl signs a preference card or pledge statement, she is considered pledged to that sorority whether or not she completes the pledge ceremony. The pledge period lasts for one calendar year and during this time she is ineligible to pledge another sorority.
   c. If for some reason, the girl or the sorority breaks a pledge, the girl is not eligible to pledge any sorority or repledge until one calendar year from the date her pledge was broken.
2. Initiation Requirements
   a. In order to be initiated into a sorority, a girl must have passed the previous semester with at least a 2.2 average for the semester and must have taken nine academic credit hours. Grade for physical education are not included.
   b. A pledge with 56 academic credits at the beginning of her pledgeship and a 2.2 average for the previous semester may be initiated after a six week period if not contrary to the national policy of the individual chapter.
   c. A transfer student who has completed her pledgeship and met the academic requirements of the previous school may be initiated and shall be counted as an active member if not contrary to the national policy of the individual chapter.

The University reserves the right to change any provision or requirement at any time within the student's period of residence.

GENERAL EDUCATION REQUIREMENTS

A college education implies something more than an adequate technical training in the student's field or specialization. In order that each graduate with a bachelor's degree may gain a liberal education as well as a specialized one, the University has established a General Education Requirement. This requirement consists of 34 semester hours of credit in six general fields. There is a wide choice in specific courses which may be used to satisfy requirements in all six of the fields. Physical education and health requirements for all students are taken in addition to this 34-hour group of courses.

1. The General Education courses are as follow:

In English (9 hours—one course in composition* and two courses in literature): ENGL 101 (001)—Composition or ENGL 171 (021)—Honors Composition; ENGL 201 (003)—World Literature; ENGL 202 (004)—World Literature; ENGL 211 (055)—English Literature; ENGL 212 (056)—English Literature; ENGL 221 (057)—American Literature; ENGL 222 (058)—American Literature; ENGL 241 (009)—Introduction to Narrative Literature; ENGL 242 (015)—Readings in Biography; ENGL 243 (030)—Introduction to Poetry and Poetics; ENGL 271 (033)—Honors World Literature; ENGL 272 (034)—Honors World Literature; ENGL 292 (010)—Composition and Literary Types. General Education 289 (080) and literature courses in a foreign language may also be used.

In *Fine Arts* or *Philosohy* (3 hours), three-credit courses in six departments are available as follows: ARCHITECTURE COURSES: 270 (030)—Introduction to the Built Environment. ART COURSES: ARTH 100 (010)—Introduction to Art: 260 (060) or 261 (061)—History of Art; 284 (062)—African Art; 320 (065) or 321 (066)—Masterpieces of Painting; 330 (067) or 331 (068)—Masterpieces of Sculpture; 340 (070) or 341 (071)—Masterpieces of Architecture. DANCE COURSES: 200 (032)—Introduction to Dance; 482 (182) or 483 (183)—History of Dance; 484 (184)—Theory and Philosophy of Dance. MUSIC COURSE: 130 (020)—Survey of Music Literature. DRAMATIC ART COURSES: 110 (016)—Introduction to the Theatre; 314 (114)—The Film as an Art Form. PHILOSOPHY COURSES: 100 (001)—Introduction to Philosophy; 140 (045)—Ethics; 170 (041)—Elementary Logic and Semantics; 233 (052)—Philosophy in Literature; 236 (053)—Philosophy of Religion; 250 (056)—Philosophy of Science; 330 (147)—Philosophy of Art; 444 (154)—Political and Social Philosophy; 457 (152)—Philosophy of History; General Education 289 (080).

*Students who are exempted from the composition requirement on the basis of acceptable scores on the SAT Verbal and Illinois Rhetoric Test or by earning a score of 2 on the English advanced placement examination may substiute any three-hour course approved for General Education credit.

In *History* (6 hours), any combination of history courses (except state history) for which the student is eligible.

In *Mathematics* (3 hours), any course carrying credit of three or more hours for which the student is eligible will satisfy this University requirement. (Note, however, that some curricula require higher-numbered sequences than those for which the student is eligible at the time of his admission; while other sequences may be open *only* to students registered in specified curricula.) Students in science curricula will usually satisfy this requirement automatically.

In *Science* (7 hours), students are required to take one course in a physical science and one course in a biological science; one of these must be a laboratory (4-hour) course. The physical sciences for this purpose are agronomy, astronomy, chemistry, geology, and physics; biological sciences are biology, botany, entomology, and zoology. General Education 299 (090) may also be used. Students whose curricula include seven or more hours of physical or biological science are not required to take additional courses to meet this distribution requirement. The nonscience student may register for a basic course or any higher course for which he is eligible by placement, prerequisite and class standing.

In *Social Science* (6 hours), two courses may be chosen from ten fields: Agricultural Economics 240 (040)—Environment and Human Ecology; Agronomy 103 (003)—World Crops and Food Supply; Anthropology 101 (001) or 102 (002)—Introduction to Anthropology; Economics 201 (031)—Principles of Economics, or Economics 205 (037)—Fundamentals of Economics; General Education 260 (060)—Introduction to Urban Studies; General Education 279 (070); Geography 100 (001)—Introduction to Geography; Government and Politics 100 (003)—Principles of Government and Politics, or 170 (001)—American Government, or 300 (101)—International Political Relations; Psychology 100 (001)—Introduction to Psychology; Radio and Television 124 (024)—Mass Communications in the 20th Century; Sociology 100 (001)—Introduction to Sociology. The two courses must be in different fields.

The following special *General Education* courses may be used as appropriate to satisfy the above requirements:

GNED 260 (060)—Introduction to Interdisciplinary Urban Study. (3)

First and second semesters. Summer Session. Prerequisite, sophomore standing. May be used toward the General Education requirement in social science. Two lectures and a two-hour gaming simulation laboratory a week.

(Nikkel, Shanley)

GNED 279 (070)—Selected Topics in the Social Sciences. (3)

A series of student-initiated seminars in the social sciences, usually interdisciplinary. Subject matter and faculty vary from semester to semester. Proposals must be submitted in advance to the Director of the General Education Program and approved by the Advisory Committee for General Education.

GNED 289 (080)—Selected Topics in the Humanities. (3)

A series of student-initiated seminars in the humanities, usually interdisciplinary. Subject matter and faculty vary from semester to semester. Proposals must be submitted in advance ot the Director of the General Education Program and approved by the Advisory Committee for General Education.

GNED 299 (090)—Selected Topics in the Natural Sciences. (3)

A series of student-initiated seminars in the natural sciences, usually interdisciplinary. Subject matter and faculty vary from semester to semester. Proposals must be submitted in advance to the Director of the General Education Program and approved by the Advisory Committee for General Education.

2. It should be emphasized that the 34 semester hours of General Education courses constitute a University requirement, applicable to all students receiving a bachelor's degree from the University of Maryland. Individual colleges within the University may add to, though they may not reduce, these requirements. College requirements may also specify one or more courses among the options. For example, students in the College of Business and Public Administration with the exception of economics majors satisfy part of the Social Science requirement by taking Economics 201 (031).

3. In certain of the six fields, the student's level of placement (by examination or departmental evaluation) may modify the requirement.

In general, appropriate Honors or preHonors courses may replace General Education courses for eligible students. Honors and preHonors equivalents for General Education courses are specified in the several sections of this catalog.

4. The General Education Program is designed to be spread out over the four years of college. No General Education course requires credit in any prior college course as a prerequisite. Thus, a student may (within limits of his particular curriculum) satisfy a General Education requirement in each category with any designated course for which he is eligible by placement examination, department evaluation, and class standing. Most courses numbered below 199 may be taken by freshman; most courses between 200 and 299 normally require sophomore (or honors) standing. Courses at the 300 and 400 levels are normally for juniors or seniors; that is, they require that a student have earned 56 hours of college credit while in good academic standing. Exceptions are as explicitly stated in the catalogs for the several colleges.

Special note for foreign students

The foreign student is required to take a special classification test in English before registering for the required English courses. He may be required to take Foreign Language 001 and 002—English for Foreign Students—*before* registering for English 101 (001).

PHYSICAL EDUCATION

All undergraduate men and women students who are registered for more than eight semester hours of credit are required to enroll in and successfully complete two prescribed courses in physical education. The successful completion of these courses is required for graduation. These courses must be taken by all eligible students during the first two semesters of attendance at the University, whether they intend to graduate or not. Men and women who have reached their thirtieth birthday are exempt from these courses. The thirtieth birthday must precede the Saturday of registration week. Students who are physically disqualified from taking these courses must enroll in adaptive courses for which credit will be given. A student who has 56 transferred academic credits will not be required to register for physical education. Students with one calendar year of full-time active military service may receive credit for these courses by applying to the Director of the Men's Physical Education Program.

Students majoring or minoring in physical education, recreation or health education may meet these requirements by enrolling in special professional courses.

HEALTH EDUCATION

All freshmen students are required to complete satisfactorily one semester of Health Education (HLTH 105) for graduation. Students who have reached their thirtieth birthday and students majoring in nursing are exempt from this requirement.

Additional Information

Questions about any aspect of the program may be addressed to the advisors, college deans, or the Director of General Education.

AIR SCIENCE INSTRUCTION

(Air Force ROTC)

The University of Maryland offers an entirely voluntary program of air science instruction which is designed for students interested in an Air Force Commission. Both a two-year and a four-year program are offered.

1. The two-year program consists of a six-week Field Training Session conducted on an air force base in the summer prior to the student's junior year, followed by four semesters of the professional Officer Course (Advanced Course). The two-year program is also open to graduate students from the College Park campus, provided such students have a minimum of four semesters remaining in the University at the time of enrollment in the two-year AFROTC program.

2. The four-year program consists of four semesters of the General Military Course (Basic Course) followed by four semesters of the Professiional Officer Course (Advanced Course). Students in this program must attend a four-week Field Training Program after completing their sophomore year of college and prior to commissioning. Only students in the four-year program are eligible to complete for full scholarships.

3. The Curriculum:

   General Military Course—freshman year, ARSC 100 (011) and ARSC 101 (012); sophomore year, ARSC 200 (021) and ARSC 201 (022). In the first two years, cadets meet academic classes once per week. In addition, they receive one hour of Corps Training each week.

   Professional Officer Course—junior year, ARSC 300 (101) and ARSC 301 (102); senior year, ARSC 302 (103) and ARSC 303 (104). The courses for the junior and senior years are entitled "The Growth and Development of Aerospace Power" and "The Professional Officer" respectively. They require three class hours, plus one hour of Corps Training per week.

4. The AFROTC College Scholarship Program provides scholarships for selected cadets each year in the four-year AFROTC program. Those selected receive money for tuition, laboratory expense, incidental fees, and an allowance for books for up to eight semesters. In addition, they receive nontaxable retainer pay of $50 per month. One must be in the program at the University of Maryland before he can apply for this scholarship.

5. All students in the two-year and four-year gram enrolled in the Professional Officer Course but not receiving full scholarships will receive $50 a month retainer pay for a maximum of $1,000 for the two-year period. Students also receive nominal pay (plus quarters and subsistence) while attending either the four-week or the six-week Field Training Session.

6. To be accepted into the Professional Officer Course the student must: complete the General Military Course or the six-week Field Training Session; pass the Air Force Officer Qualification Test; be physically qualified; enlist in the Air Force Reserve; be in good academic standing; meet age requirements; posess the necessary qualities of leadership and citizenship. Successful completion of the Professional Officer Course and a bachelor's degree are the prerequisites for a commission as a second lieutenant in the United States Air Force.

7. Students who have prior military service or ROTC training with the Army, Navy, Marine Corps, Coast Guard, or Air Force will be evaluated and allowed appropriate credit toward meeting the requirements for the General Military (Basic) Course.

Professional Officer Course (Advanced) credits are transferable.

Attendance at air science classes is mandatory. Excuses for class or drill absences will not be recognized except in case of sickness, emergencies, or University business covered by University excuses. All unexcused absences operate to reduce the term grade. Excessive absences and/or misconduct will be cause for dismissal.

8. Qualified seniors who elect to become Air Force pilots receive a free 36½-hour flight instruction program. Cadets are instructed by competent civilian instructors. This training enables them to earn their private pilot's license before graduating from college.

REGISTRATION

1. Instructions concerning registration are given in the *Schedule of Classes* issued at the beginning of each semester.

2. Students who do not complete their registration on regular registration days, including payment of bill, will be required to pay a late registration fee of $20.00. Only in exceptional cases will a student be permitted to enter a class later than one week after the beginning of instruction.

3. Changes in registration may be made only with the written permission of the student's dean. After the first week there is a fee of $5.00 for every change in registration. The formal change in registration approved by the dean must be filed in the Office of Registrations to complete the transaction. Unless this is done, no credit will be given for an added course, and a failure will be recorded for a dropped course.

4. An official class list for each course being offered is issued each semester to the appropriate department by the Registrations Office. No student is permitted to attend a class if his name does not appear on the class list. Instructors must report discrepancies to the Registrations Office. At the end of the semester, the Registrations Office issues to each department official grade cards. The instructors mark the final gradues on the grade cards, sign the cards, and return them to the Registrations Office.

5. A student who desires to transfer from one college to another must petition, on the reverse side of the permit to register card, the dean of the college from which he wishes to be transferred. The transfer is effected when the request, properly approved by both deans concerned, is filed in the Registrations Office. Students who are on academic probation and students who have less than a 2.0 average are referred to Section A of "Minimum Requirements for Retention and Graduation."

6. No change to another college or curriculum is permitted only at stated registration periods or during the first week of a semester.

7. A student transferring to another college will consult with his new dean regarding the adjustment of his records. A record of this adjustment must be filed in the Registrations Office. The dean's record will be transferred to the office of the college to which the student is changing.

8. Courses taken in University College or at another institution concurrent with regular registration on the campus at the University may not be credited without approval in advance by the dean of the college from which the student expects a degree. The same rule applies in summer school, to off-campus registrations or registrations in the summer school of another institution.

DEGREES AND CERTIFICATES

The University confers the following degrees: Bachelor of Arts, Bachelor of Music, Bachelor of Science, Bachelor of Science in Nursing, Bachelor of Science in Pharmacy, Bachelor of Architecture, Master of Arts, Master of Arts in American Civilization, Master of Business Administration, Master of Education, Master of Music, Master of Science, Master of Library Science, Master of Social Work, Doctor of Dental Surgery, Doctor of Education, Doctor of Medicine, Doctor of Philosophy, Doctor of Musical Arts, Doctor of Business Administration, and Juris Doctor.

Students in specified two-year curricula may be awarded certificates.

No baccalaureate degree will be awarded to a student who has had less than one year of resident work in this University. The last thirty semester credits in any curricula leading to a baccalaureate degree must be taken in residence at the University. Candidates for the baccalaureate degree in combined curricula at College Park and Baltimore must complete a minimum of thirty semester credits at College Park.

The requirements for graduation vary according to the character of work in the different colleges and schools. Full information regarding specific college requirements for graduation will be found in the various college divisions of this catalog.

Each candidate for a degree or certificate must file a formal application for it with the Registrations Office. This must be done by the end of the third week of the semester or the second week of the summer session at the end of which he expects to graduate.

CREDIT UNIT AND LOAD

The semester hour, which is the unit of credit, is the equivalent of a subject pursued one period a week for one semester. Two or three periods of laboratory or field work are equivalent to one lecture or recitation period. The student is expected to devote three hours a week in classroom or laboratory or in outside preparation for each credit hour in any course.

In order for an undergraduate student to complete most curricula in the designated amount of

time, his semester credit load must range from 12 to 19 hours, so that he would complete from 30 to 36 hours each year toward his degree. A student registering for less than 12 hours or more than 19 hours per semester must have the special approval of his dean.

EXAMINATIONS

1. A final examination shall be given in every undergraduate course. Exceptions may be made with the approval of the head of the department and the dean. In order to avoid basing too much of the semester grade upon the final examination, additional tests, quizzes, term papers, reports and the like should be used to determine a student's comprehension of a course. The order of procedure in these matters is left to the discretion of departments or professors and should be announced to a class at the beginning of a course. All final examinations must be held on the examination days of the Official Final Examination Schedule. No final examination shall be given at a time other than that scheduled in the Official Examination Schedule without written permission of the department chairman.

2. To expedite arrangements for commencement, final grades of undergraduate candidates for degrees are based on evaluations available at the time grades are required to be submitted.

3. A file of all final examination questions must be kept by the head of each department.

4. The head of each department is responsible for the adequate administration of examinations in courses under his jurisdiction. The deans should present for consideration the matter of examinations in staff conferences from time to time and investigate examination procedures in their respective colleges.

5. Every examination shall be designed to require for its completion not more than the regularly scheduled period.

6. A typewritten, mimeographed or printed set of questions shall be placed in the hands of every examinee in every test or examination requiring at least one period, unless the dean of the college has authorized some other procedure.

7. Each instructor must safeguard his examination questions and all trial sheets, drafts and stencils.

8. Each instructor should avoid the use of examination questions which have been included in recently given examinations and should prepare examinations that will make dishonesty difficult.

9. Only clerical help approved by the department chairman shall be employed in the preparation or reproduction of tests or examination questions.

10. Proctors must be in the examination room at least ten minutes before the hour of a final examination. Provisions should be made for proper ventilation, lighting and a seating plan. At least one of the proctors present must be sufficiently cognizant of the subject matter of the examination to deal authoritatively with inquires arising from the examination.

11. Books, papers, etc., belonging to the student, must be left in a place designated by the instructor before the student takes his seat, except in such cases where books or work sheets are permitted.

12. Students should be seated at least every other seat apart, or its equivalent, i.e., about three feet. Where this arrangement is not possible some means must be provided to protect the integrity of the examination.

13. "Blue books" only must be used in periodic or final examinations, unless special forms are furnished by the department concerned.

14. If mathematical tables are required in an examination, they shall be furnished by the instructor. If textbooks are used, this rules does not apply.

15. Proctors must exercise all diligence to prevent dishonesty and to enforce proper examination decorum, including abstention from smoking.

16. Where an instructor must proctor more than 40 students, he should consult the chairman of his department concerning proctorial assistance. An instructor should consult his department chairman if in his opinion a smaller number of students for an examination requires the help of another instructor.

17. No student who leaves an examination room will be permitted to return, except in unusual circumstances, in which case permission to do so must be granted by the proctor prior to the student's absention.

18. All conversation will cease prior to the passing out of examination papers, and silence will be maintained in the room during the entire examination period.

19. Examination papers will be placed face down on the writing desks until the examination is officially begun by the proctor.

20. Examination papers will be kept flat on the writing desk at all times.

IRREGULARITIES IN EXAMINATIONS

1. In cases involving charges of academic irregularities or dishonesty in an examination, class work or course requirements by an undergraduate student, the instructor in the course shall report to his instructional department chairman any information received and the facts within his knowledge. If the chairman of the instructional department determines that there is any sound reason for believing that academic dishonesty may be involved, he shall refer the matter to the dean of the college or school. The dean will then confer with the dean of the student's college or school and will check the Judiciary Office records to determine if the student has any record of prior of-

fenses involving academic dishonesty. The dean will then consult with the student involved, and if the alleged academic dishonesty is admitted by the student and is his first offense of this nature, the dean may authorize the department chairman to dispose of the charges, limiting the maximum penalty to disciplinary probation and a grade of F in the course, provided the penalty is accepted by the student in writing. In such case the department chairman will make a written report of the matter, including the action taken, to the dean of the student's college or school and to the Judiciary Office.

If the case is not disposed of in the above manner, the dean of the instructional department will appoint an *ad hoc* Committee on Academic Dishonesty consisting of one member from the faculty of the college or school administered by the dean as chairman, one undergraduate student, and one member from the faculty of the student's college or school appointed by the dean of that college or school. If the student's dean and the dean administering the instructional department are the same, a second member of the faculty of the college or school concerned is appointed.

The dean of the instructional department will refer the specific report of alleged academic dishonesty to this *ad hoc* committee and the committee will hear the case. The hearing procedures before this committee will in general conform to those required for student judicial boards. The committee may impose the normal disciplinary actions and/or impose a grade of F in the course.

The chairman of the committee will report its actions to the dean of the student's college or school and to the Judiciary Office. The dean of the instructional department will advise the student in writing of the disciplinary action of the committee, and also advise him of his right to file an appeal to the Adjunct Committee on Student Discipline.

The student may file his appeal in accordance with the normal procedures to the Adjunct Committee with the dean of the instructional department and the latter will forward it to the chairman of the Adjunct Committee. The chairman of the Adjunct Committee will notify the student in writing of the time, date, and place of the hearing.

2. In cases involving charges of academic irregularities or dishonesty in an examination, class work or course requirements by a graduate student, the above procedure will be followed except that:

a. The chairman of the instructional department will refer the matter to the Dean for Graduate Studies and Research.

b. The *ad hoc* Committee on Academic Dishonesty will be appointed by the Dean for Graduate Studies and Research and will consist of two members of the Graduate School faculty, one serving as chairman and one graduate student.

MARKING SYSTEM

1. The following symbols are used for marks: A, B, C, and D—Passing; F—Failure; I—Incomplete. At the Graduate level, the grade of D is failure.

In computing scholastic averages, numerical values are assigned marks as follows: A—4; B—3; C—2; D—1; F—0.

A mark of X will be used on records of off-campus adult students in those cases where such a student has ceased to attend a class without an official withdrawal. A mark of X indicates no record, no prejudice, is terminal, and may not be later changed as in the case of the incomplete mark of I.

2. Mark A denotes superior achievement; B, good; C, fair; and D, passing. However, a mark of D does not represent satisfactory progress toward a degree.

3. A student with a mark of F has failed in the course and must repeat the entire course in order to receive credit for it. In case of failure in a required course a student must enroll again in that subject the first time it is offered, unless excused by the dean.

4. An instructor may change a grade already submitted to the Registrations Office only on certification, approved by his department chairman and dean, that he made an actual mistake in computing or recording the grade.

5. In case a failure is incurred in an elective subject, the student may be permitted to make a substitution provided the head of the department in which the student is majoring and the student's dean approve. A record of this approval must be filed in the Registrations Office.

6. The mark of I (incomplete) is exceptional. It is to be given only to a student whose work in a course has been qualitatively satisfactory, when, because of illness, or other circumstances beyond his control, he has been unable to complete the requirement. In no case will the mark I be recorded for a student who has not completed the major portion of the work of the course. In cases where this mark is given, the student may not reregister for the course until the I is removed by completing work assigned by the instructor. Work must be completed by the end of the next semester in which the subject is again offered and the student is in attendance at the University, or the mark becomes F. When a student receives a terminal grade, he may repeat the course as provided for any course where repeats are authorized. Exceptions to the time period cited above may be granted by the student's dean on the written request of the student if circumstances warrant further delay. An I cannot be removed through the technique of earning "credit" by examination."

7. It is the student's responsibility to request appropriate action for the removal of the I.

8. It is the responsibility of the instructor and

department head concerned to return the appropriate supplementary grade report promptly upon the completion of the work.

9. It is the responsibility of the student's dean to inform the Registrations Office and instructor of the delay granted in accordance with Section 6 above.

10. For information about repeating courses, see "Minimum Requirements for Retention and Graduation."

PASS-FAIL OPTION

1. Eligible undergraduates may register for a maximum of 18 semester hours of credit under the pass-fail option between the time they have earned 30 academic hours at the University of Maryland and graduation. No more than one such course may be taken during any semester or summer session.

2. In order to be eligible for the pass-fail option in registration an undergraduate student must have completed 30 or more semester hours of credit at the University of Maryland. Transfer students must have a total of 30 semester hours on their records, of which at least 15 semester hours were taken at the University of Maryland. Part-time students matriculated for a degree are eligible; special students are not. A student must have a cumulative grade-point average of 2.00 to be eligible for the pass-fail option. Students who are registered in O.I.R. may not elect the pass-fail option.

3. No course which is used to fulfill requirements for a major, a minor, a field of concentration, specific courses designated as degree requirements, or the general education program may be selected under the pass-fail option; such selection is limited to free-elective courses.

4. A student's pass-fail option for a course must be designated at the time of registration. Courses not specifically excluded from the pass-fail option may be selected by eligible students who have the required standing and prerequisites for the course. Registration for pass-fail option must have the approval of the student's academic advisor and dean. This status may not be changed after the end of late registration (end of first week of class in regular semester). If the demand for a course exceeds its capacity, letter-graded students will be given preference over pass-fail students in enrollment.

5. Students registering in a course under the pass-fail option are required to complete all regular course requirements. Their work will be evaluated by the normal procedures for letter grades. The professor will submit the normal grade. The grades of "A" to "D" will be automatically converted to "P." The grade of "F" will remain as given. If the course is passed, credit toward graduation is earned; however, the course is not included in the grade average. If the course is failed, no credit is awarded but the failing grade is included in computation of averages.

CREDIT FOR EXAMINATION FOR UNDERGRADUATE STUDIES

1. The applicant must be a registered student at the University of Maryland. Part-time students must be enrolled in course work carrying at least three semester hours of credit.

2. The total amount of credit that can be established by examination cannot exceed 30 semester credits, nor may it be part of the final 15 semester credits of the student's program. "Credit by examination" cannot be given for a course in which the student has a grade of "I" outstanding.

3. A grade of D or higher must be obtained in order to establish credit by examination. Letter grades, including F's earned on examinations to establish credit will be entered on the student's transcript and used in computing his cumulative grade point average. Such credits shall be followed by the phrase "By Exam" or "By CLEP Exam," whichever is applicable. A student may elect to take an examination for credit on a "Pass-Fail" basis under the normal "Pass-Fail" regulations.

4. Approval to take an examination in any course will depend on the student's having received approval of his Academic Adviser, the Chairman of the Department offering the course and the Dean of the College in which the student is enrolled.

5. The instructor must certify on the report of the examination submitted to the Registrations Office that copies of the examination questions or identifying information in the case of standardized examinations, and the student's answers have been filed with Chairman of the Department offering the course.

JUNIOR STANDING

1. A student is permitted to register for upper division courses when granted Junior Standing by his college. This permission shall be based upon earning a minimum of 56 academic hours toward his degree, completing such course requirements as the college may direct, and possessing the minimum required grade point average to remain in the University.

2. Exceptional students having completed forty-eight (48) semester hours of academic credits and having the approval of the department involved will be permitted to enroll for sufficient upper division courses to complete a normal program. That is, such students must carry lower division courses to total fifty-six (56) semester hours of academic credits and the remainder may be in courses numbered in the 300-499 range.

DEGREE REQUIREMENTS

1. A baccalaureate degree will not be awarded to a student who has had less than one year of

resident work in this University. The last thirty semester credits of any curriculum leading to a baccalaureate degree must be taken in residence at the University of Maryland.

In the case of veterans and students engaged in a program of adult education, a portion of the final 30 semester hours may be completed at other institutions upon the approval of the Vice-Chancellor for Academic Affairs, the dean of the college, and the chairman of the department.

Candidates for degrees in combined programs must complete at least 30 semester credits at College Park.

The minimum residence required for a baccalaureate degree is 30 semester hours; nothing stated below modifies in any way this basic requirement. Included in these 30 semester hours will be a minimum of 15 semester hours in advanced courses, including at least 12 semester hours required in the major field (in curricula requiring such concentration). All candidates for degrees should plan to take their senior year in residence since the advanced work of the major study normally occurs in the last year of the undergraduate course. At least 24 of the last 30 credits must be done in residence; i.e., a student who at the time of his graduation will have completed 30 semester hours in residence may be permitted to do not more than 6 semester hours of his final 30 credits of record in another institution or to include not more than 6 semester hours of credit earned by advance standing examination, provided he secures permission in advance from his dean. The student must be enrolled in the college from which he plans to graduate when registering for the last 15 credits of his program. These requirements apply also to the third year of preprofessional combined degree programs. Record of this permission must be filed in the Registrations Office prior to the student's final semester in residence.

While many University curricula require more semester hours than 120 (exclusive of the basic General Military Course AFROTC, Health 105, and the required program in physical education), no baccalaureate curriculum requires less than 120 semester hours with the same exclusions as have been cited.

A student who wishes to earn a second baccalaureate degree in the University is required to complete the additional studies regularly prescribed for that degree, involving at least one year's additional residence and the earning of at least 30 additional credits.

2. A general C (2.0) average is required for graduation in all colleges.

3. An average mark of C (2.0) is required for graduation. The C average is computed on the basis of the academic courses required by each student's curriculum. *The average of transfer students and of those seeking combined degrees is computed only on the courses taken in residence in the University and in satisfaction of the non-professional curricular requirements of the college granting the degree.* An over-all average is also computed to include all academic courses taken in the University as a basis for the award of honors and for such other uses as may be deemed appropriate.

4. Applications for diplomas must be filed with the Registrations Office during the registration period, or not later than the end of the third week of classes of the regular semester or at the end of the second week of the summer session, at the end of which the candidate expects to receive his degree. Application filed after the third week of classes of a regular semester or Friday of the second week of a Summer Session will be retained until the next semester (session) when degrees will be awarded. He must at this time be registered in the college from which the degree is sought or, if in the University College, have the approval of the dean of the college concerned. Responsibility for knowing and meeting all degree requirements for graduation in any curriculum rests with the student. Not later than the close of his junior year, the student should check with the proper authorities to ascertain his standing in this respect. For this purpose the student should be sure to preserve the copy of the semester grade report issued by the Registrations office at the close of each semester.

5. Candidates for degrees must attend a convocation at which degrees are conferred and diplomas are awarded.

ATTENDANCE

1. The University expects each student to take full responsibility for his academic work and academic progress. The student, to progress satisfactorily, must meet the quantitative and qualitative requirements of each course for which he is registered. Students are expected to attend classes regularly, for consistent attendance offers the most effective opportunity open to all students to gain a developing command of the concepts and materials of their course of study. However, attendance in class, in and of itself, is not a criterion for the evaluation of the student's degree of success or failure. Furthermore, absences (whether excused or unexcused) do not alter what is expected of the student qualitatively and quantitatively. Except as provided below, absences will not be used in the computation of grades, and the recording of student absences will not be required of the faculty.

2. In certain courses in-class participation is an integral part of the work of the course. A few examples would be courses in public speaking and group discussion, courses emphasizing conversation in foreign languages, certain courses in physical education, and certain laboratory sessions. Each department shall determine which of its

courses fall in this category. It shall be the responsibility of the instructor in such courses to inform each class at the beginning of the semester that in-class participation is an integral part of the work of the course and that his absences will be taken into account in the evaluation of his work in the course.

3. Laboratory meetings require special preparation of equipment and materials by the staff. A student who is not present for a laboratory exercise has missed that part of the course and cannot expect that he will be given an opportunity to make up this work later in the term.

4. Special provision for freshmen: the freshman year is a transitional year. Absences of freshmen in the basic freshman courses will be reported to the student's dean when the student has accumulated more than three unexcused absences.

5. Excuses for absences (in basic freshman courses and in courses where in-class participation is a significant part of the work of the course) will be handled by the instructor in the course in accordance with the general policy of his department and college.

6. Examination and tests: it is the responsibility of the student to keep himself informed concerning the dates of announced quizzes, tests and examinations. An instructor is not under obligation to give a student a make-up examination unless the student can present evidence that his absence was caused by illness or by participating in University activities at the request of University authorities. A make-up examination, when permitted, is given at the convenience of the instructor, but must not interfere with the student's regularly scheduled classes.

SCHOLARSHIP HONORS

Honors for excellence in scholarship are awarded to not more than one-fifth of the graduation class in each college. (The computation does not include grades for courses taken during the last semester of registration before graduation.) "High Honors" are awarded to the upper half of the group; "Honors" to the lower half. To be eligible for this recognition, a total of at least two years of residence (60 semester hours) is required. No student with an average less than B (3.0) will be considered.

DEFICIENCY REPORTS

1. Reports of unsatisfactory work (less than C) will be made only for freshmen in the basic freshman courses. It will be the obligation of all students to assume full responsibility for their academic progress without depending upon receiving official warning of unsatisfactory work.

2. Reports of unsatisfactory work for freshmen in the basic freshman courses will be submitted to the student's dean at the end of the seventh week of the semester.

DISMISSAL OF DELINQUENT STUDENTS

The University reserves the right to request at any time the withdrawal of a student who cannot or does not maintain the required standard of scholarship, or whose continuance in the University would be detrimental to his or her health, or to the health of others, or whose conduct is not satisfactory to the authorities of the University. Specific scholastic requirements are set forth in the Minimum Requirements for Retention and Graduation.

WITHDRAWALS FROM THE UNIVERSITY

1. If a student desires or is compelled to withdraw from the University for any cause at any time during the academic year, he should secure an application for withdrawal from his dean's office, obtain the proper signatures as indicated on the form, and file it in the Registrations Office. If a student withdraws from the University after the first eight weeks of the semester, the instructor in each course indicates on the class card whether the student was passing or failing at the time of withdrawal. The report is made part of the student's permanent record.

2. In the case of a minor, withdrawal will be permitted only with the written consent of the student's parent or guardian.

3. A student who fails to withdraw in the required manner will not be entitled to an honorable dismissal, will forfeit his right to any refund to which he might otherwise be entitled, and will receive marks of failure in all courses being carried.

4. The effective date for withdrawals, as far as refunds and grades are concerned, is the date the blank is filed in the Registrations Office.

5. Further information on withdrawal from the University may be found in "Minimum Requirements for Retention and Graduation."

READMISSION AND REINSTATEMENT

1. A student whose continuous attendance at the University has been interrupted, but who was in good academic standing, or on academic probation, at the end of the last regular semester for which he was registered, must apply to the Director of Admission for readmission. He will be readmitted to the college in which he was last registered.

2. A student who withdraws from the University must apply to the Director of Admissions for reinstatement.

3. A freshman who is dismissed for scholastic reasons from the University at the end of his first semester and who desires to seek reinstatement is referred to Section A of "Minimum Requirements for Retention and Graduation."

4. A student who has been dropped for scholastic reasons may appeal in writing to the Secretary of the Admissions Petition Board, Office of Admissions for reinstatement. The committee is empowered to grant relief for just cause.

5. No student on academic probation shall be allowed to register for more than sixteen (16) semester hours (including the basic General Military Course AFROTC and required courses in P. E. and health). The student on academic probation should normally carry at least twelve (12) academic semester hours in order that he may absolve his academic probation in one semester.

6. A student who has been dropped from the University for scholastic reasons, and whose petition for reinstatement is denied, may again petition after a lapse of at least one semester.

7. Applicable courses taken at another institution by a student in the first semester after his academic dismissal from the University shall not be considered for transfer credit until the student has returned to the University and removed his academic probation.

MINIMUM REQUIREMENTS FOR RETENTION AND GRADUATION

The provisions in this plan apply to undergraduates at College Park, including the day-time, on-campus students of University College.

SECTION A: Minimum requirements

A.1 At the end of each grading period—defined as each regular semester—the Registrations Office computes each student's cumulative grade point average (the number of earned quality points divided by the number of attempted semester hours hereinafter designated and referred to as "attempted hours" or "hours attempted"). Based on this cumulative grade point average the Registrations Office imposes the academic actions prescribed in the following table:

Total Hours Attempted	Cumulative Grade Point Average resulting	
	Academic Dismissal	Acadamic Probation
1-5	—	—
6-20	Below 0.35	Below 1.35
21-35	" 1.35	" 1.65
36-50	" 1.65	" 1.80
51-65	" 1.80	" 1.90
68-80	" 1.90	" 2.00
81 and over	" 1.95	" 2.00

A.2 Regardless of his cumulative grade point average, however, no student shall be dismissed at the end of any grading period during which he was registered for and completed at least twelve (12) semester hours (excluding PHED 001-099) with an average of 2.00 or better.

A.3 A minimum cumulative grade point average of 2.00 is an essential part of the several requirements for a bachelor's degree as outlined in college divisions of this catalog. Any student whose cumulative grade point average falls within the range which results in Academic Probation in accordance with the table of section A.1 is informed that he is not making satisfactory progress toward his degree and must assume responsibility for any future dismissal which may occur.

A.4 Any student whose cumulative grade point average falls within the range which results in Academic Dismissal in accordance with the table of section A.1 loses his eligibility to reregister at the University.

A.5 Any student who is not eligible to reregister following Academic Dismissal should consult the Secretary of the Admissions Petition Board concerning procedure for reinstatement. This Board is empowered to grant relief for just cause.

A.6 A student who enters the University with acceptable transfer credits is subject to these scholastic standards at the level of attempted hours determined by adding the number of hours of transfer credits assigned to him by the Office of Admissions and the dean of the college in which he is enrolled to the number of hours attempted at Maryland. His cumulative average is based solely on the number of hours attempted at Maryland and the grades received for these attempted courses.

A.7 When a course is repeated, all attempts are included in the computation of the cumulative grade point average through inclusion in both the total quality points earned and the total hours attempted. If a student repeats a course for which he has already earned a passing grade, the subsequent attempt shall not increase his total hours earned toward a degree.

A.8 Exceptions are allowed for courses taken during a freshman's first semester and subsequently repeated. In such cases, the original first semester grades of these repeated courses and their corresponding credit hours will not be included in the computation of the student's cumulative grade point average or in his total of attempted hours, provided these repetitions of first semester courses occur before the student has earned 56 semester hours. For the purpose of this section a first semester freshman shall be a student registered for the first time in college level educational courses and thus experiencing his first contact with academic education beyond the senior high school level. However, a student whose first college experience is through part-time registration or through the summer session will be considered as a first semester freshman until he has registered in and completed a minimum of nine semester hours in college level work. All college registrations will be counted whether or not they are applicable to the student's program.

A.9 A student beginning or within his last thirty (30) credit hours necessary for graduation who has been retained in college under section A.2 but who would be unable to graduate because of an insufficient cumulative grade point average due to an earlier single semester of failing grades may be granted waiver of those failing grades. Provided such student satisfies all other college and university requirements for the degree, the above grades of failure and their corresponding attempted credit hours may be disregarded in the

computation of his final cumulative grade point average. To accomplish this the approval of the student's academic dean together with the written recommendation of the chairman of the department in which the student is majoring must be transmitted to the Registrations Office with the necessary adjustments which are to be made in recomputing the student's cumulative average.

A.10 Physical activity courses required of all students, noncredit courses, and orientation courses are not considered in computing cumulative grade point averages. All other courses are considered for computation except those courses specifically designated not applicable by the dean of the college in which the student is enrolled.

A.11 In the computation of the cumulative grade point average a grade of I is not to be included as hours attempted. When the grade of I is removed for a passing grade or the mark becomes F in conformance with academic regulations, an appropriate corrective entry will be made in the cumulative grade point average by the Registrations Office.

A.12 Any student who withdraws from all courses receiving no grades or grades of W, WX, WP, or WF is not eligible for reregistration at the University except by application for reinstatement through the Office of Admissions. Withdrawal grades are not included in the computation of grade point averages or in the determination of the level of total hours attempted.

SECTION B: Regulations for transfer of students from one college to another and change of curriculum within a college.

B.1 A student with a 2.00 average or better in those courses applicable to his proposed new curriculum may transfer from one college in the University to another but only at such times as are specifically designated for this purpose. On a special form, he must first obtain a signed release and his complete academic record from the dean of the releasing college before submitting them to the dean of the college to which he wishes to transfer. When the dean of the receiving college accepts the student by signing the transfer form, the student must then deposit this form with the Registrations Office to complete the transfer.

B.2 In all transfer cases the dean of the receiving college shall indicate what courses in the student's previous academic program are not applicable in the new program and he shall notify the Registrations Office of the adjustments which are to be made in computing the student's cumulative average.

B.3 The Office of Intermediate Registration (OIR) serves those students who wish to change colleges but have less than 2.00 averages in those courses applicable to their new college curricula. Any such student who is entitled to reregister in the University will be accepted by OIR after securing his release from his former college dean. The Director of Intermediate Registration will be responsible for notifying the Registrations Office what courses in the student's previous academic program have been declared not applicable by the prospective receiving dean.

B.4 The cumulative average required of a registrant in OIR shall be that given in the table of section A.1 for the attempted hours applicable to the new curriculum to which the student anticipates transferring. If at the end of a student's first grading period in OIR his cumulative average entitles him to remain in the University, he shall be permitted to transfer to his new college. However, upon the recommendation of both the Director of Intermediate Registration and the dean of the new college, the student who is eligible to remain in the University may be permitted to register for an additional semester or summer session in OIR.

B.5 When a student changes from one department to another within a college he must secure, in the appropriate space on the permit-to-register card, the signature of the dean before filing the card with the Registrations Office. An individual college may use additional forms for internal control if it so desires. Where the change within a college is from a program to an unrelated program, the dean of the college may exercise the option of adjusting the student's record. The dean is responsible for providing the Registrations Office with a written statement of the adjustments to be made in computing the student's cumulative average.

SECTION C: Regulations concerning dropping of courses.

C.1 A student may drop a course without an F grade during the first three weeks of classes with the approval of the student's advisor and dean. A student may drop a course without an F grade after the first three weeks of clases only upon written approval of the dean of the student's college. Such authorization shall be granted by the dean only under extraordinary circumstances; unsatisfactory scholarship in itself will not be considered an extraordinary circumstance. The written authorization must state the reason and shall be filed with the Registrations Office. In order to drop a course, or courses, for medical reasons and without the grade of F, the student must present to the dean of his college, through the University's infirmary, acceptable proof that such reasons have caused his continuous absence from all classes for which he is registered for a period of two weeks or more (exclusive of holidays). Any request to drop a course for medical reasons must be presented to the student's dean within one week of the student's return to class attendance.

The selection of courses to be dropped shall be at the discretion of the student's dean.

In the case of accidental injury incurred after the start of the term, and which incapacitates the student relative to his performance in a particular course, the dean of the student's college shall use

his discretion in recommending the dropping of the course without the grade of F. Where accidental injury does not necessitate the absence of the student from all classes for a period of two weeks or more, the request to drop a particular course must be made within one week of the injury, or within one week of the return to classes following the injury. A first semester freshman and a transfer student enrolling for the first time in the University may drop a course without an F grade during the first eight weeks of classes with the approval of the students advisor and dean. For purposes of this section a first semester freshman shall be a student who has registered in and completed not more than nine semester hours of college level work.

Courses may not be changed from credit to audit after the third week of clases.

C.2 A student withdrawing from the University during the first eight weeks of classes shall be given a grade of WX in his courses. A student withdrawing after this time shall receive a grade WP in each course in which his work has been passing and a grade of WF in any course in which his work has not been passing. A student withdrawing after the last day of instruction shall be given a grade of F in any course in which he has not been doing passing work.

SECTION D: General regulations concerning academic probation, academic dismissal and reinstatement.

D.1 When a student is placed on academic probation or released from academic probation, the action shall be entered on the face of the student's official record.

D.2 A student who is reinstated after academic dismissal shall be admitted on academic probation. The same conditions of probation may be imposed on any student who seeks admission by transfer from another university or college and whose record at the previous school warrants this action. (Admissions of such a student is permitted only in unusual cases and after a review by the Petition Board.)

D.3 Any appeal from the regulations governing academic probation or academic dismissal shall be directed to the Petition Board which shall be empowered to grant relief in unusual cases, if the circumstances warrant such action.

SECTION E: Students enrolled prior to June 1965.

Termination

Students enrolled in the University prior to June 1965 and who have remained in continuous attendance must abide by the provisions of Academic Probation Plan. (See earlier issues of University General and Academic Regulations.) Students initially enrolled in the University prior to June 1965 who do not fulfill the above conditions of continuous attendance but who have remained in continuous attendance following their most recent readmission or reinstatement will also abide by the provisions of the Academic Probation Plan, provided the most recent readmission or reinstatement was prior to June 1970. Students enrolled prior to June 1965 whose continuous attendance is interrupted for any reason and who are readmitted or reinstated for a session or semester beginning with June 1970 will be readmitted or reinstated under the provisions of Minimum Requirements for Retention and Graduation.

VICE CHANCELLOR FOR STUDENT AFFAIRS

The Office of the Vice Chancellor for Student Affairs coordinates activities within the academic community which serve to complement the scholarly pursuits of the classroom and enable the student to gain maximum value from his college experience.

Some of the various administrative areas for which the Vice Chancellor of Student Affairs is responsible are: University Health Services; Counseling Center; Placement and Credentials Services; Student Aid; International Education Services and Foreign Student Affairs; University Housing; Student Union; Student Activities; Judiciary Office; Food Service; Office of Intermediate Registration (OIR); Intensive Educational Development; Cultural Study Center; Religious Programs, and Black Student Development Programs.

HEALTH CENTER

The Health Center is primarily charged with aiding the student in maintaining his physical well-being in order that he may pursue his studies as effectively as possible. This includes the review of all pre-entrance physical examination reports to aid the student in his participation in the required physical education classes or in other areas where special problems might arise. Students are invited to visit the Health Center before or during registration time to review these reports with a staff member.

Routine Services

The Health Center provides the following services:

1. Treatment, or preventive measures, for acute and short term illnesses and surgical emergencies.
2. Selected laboratory procedures, including x-rays and electrocardiograms.
3. Infirmary rest for minor or short term illnesses and injuries.
4. Allergy hyposensitization and certain disease immunizations arranged through the student's physician.
5. Psychiatric services, including short term counseling with students who request to see the psychiatrist, and consultation and evaluation functions in connection with Health Center physicians or the Counseling Center.
6. Physical therapy prescribed by a Health Center physician.

The Health Center refers most chronic and major illnesses or injury effects to family and local physicians and specialists. No dental care is furnished at the Health Center, but medication to allay pain and instruction in oral hygiene is given.

The Health Center sanitarians promote the campus environmental health through routine inspection and subsequent recommendations in the areas of food handling, water and air pollution problems, living accommodation, and sewage disposal.

Emergency Services

During regular University sessions, emergency physician care is available on weekday evenings at the Infirmary and by telephone call (454-3444 or 454-3445) to Health Center. During extended school vacation periods or between regular sessions, the physician may be called through the campus telephone operator (454-3311) for emergencies occurring on the campus.

Emergency ambulance service is provided through the Branchville Volunteer Rescue Squad by call to 3333 on campus phones or 864-1122 from outside phones. For patients who do not require ambulance service, but who cannot come to the infirmary in their own transportation, the Campus Police may be summoned for assistance at 3555.

In addition to student emergencies, the Health Center will treat, or prepare for transfer to a hospital, any campus employee injured on the job. An employee or visitor with acute illness who cannot be taken directly to his own physician or hospital may also be seen at the Health Center.

Accident and Medical Insurance

Commercial Contract Accident or Accident and Illness Group Insurance is available to students through the University on an optional basis for a nominal fee and is highly recommended for those who do not already have this type of coverage. All foreign students are required to have this or an equivalent form of insurance. This insurance may only be purchased at the time of registration.

Health Center Hours

The University Health Center hours for routine care during regular semesters and summer school are:

Monday through Friday 8:00 a.m. to 11:45 a.m. and 1:00 p.m. to 5:00 p.m.

Semi-emergency or appointment care is available:

Monday through Friday 6:00 p.m. to 10:00 p.m.

Saturday 9:00 a.m. to 11:00 a.m.

Sundays and Holidays 10:00 a.m. to 11:00 a.m.

Twenty-four hour nursing care is available during school sessions.

COUNSELING CENTER

The aim of the Counseling Center is to enable students to be optimally productive, to better understand themselves, their assets and liabilities and to be able to resolve their problems and deal with important decisions. The services of the center are available to all students.

Counseling

Counselors meet with students in individual or group counseling interviews to assist them with educational, vocational and personal problems. Where appropriate, the counselor may arrange for students to take certain tests of ability, interest, personality, etc., which provide information valuable in counseling.

Occupational Information

Students may browse in the Center occupational library and view displays of occupational and educational information. They may be interested in listening to the tape-recorded introduction to career information.

Reading and Study Skills Laboratory

The laboratory offers students individualized programs designed to improve their learning skills. They may work on improved reading speed and comprehension, vocabulary building, taking of lecture notes, spelling, examination skills, and handwriting. Special workshops are offered in improving writing skills and reducing examination fears. A library of tutor-texts and tape recorded lectures is available for review of fundamentals in science, language, logic, and mathematics courses. There is a special program for high school students.

Consultation

The Counseling Center also serves as an agency which students, faculty members, parents and others may use for discussing any concerns which they may have regarding the progress or general welfare of students at the University.

Child Evaluation and Parent Consultation

This community service, on a nominal fee basis, is provided for parents of children in the age range of five to fourteen regarding concern for their children's achievement or behavior. It is not restricted to University-connected individuals.

Other Functions

Other functions include the freshman testing program, orienting new students to the center's services, conducting the annual census studies of the student body, and data processing consultation and services. The staff is available for speaking engagements before various student and community groups. The center also serves as a facility for the professional training of counselors.

The help you understand the Counseling Center, here are a few of the problems with which students have been concerned. One or two of these illustrations may touch on concerns which you might have at one time or another.

What kinds of vocations am I best fitted for?
I'd like some help in choosing a major.
I wish I had more confidence in myself.
I just can't make the grades I'd like to have.
I feel sort of alone—pretty much out of things.
My dates and I don't seem to get along.
My parents and I don't get along.
Where can I find some information about occupations?
What can I learn from those Freshman Entrance Tests that will help me in college?
I can't seem to concentrate when I study.
How much should I expect of myself?
I read and comprehend fairly well, but I would like to improve further.

Is my vocational goal a realistic one for me?
I worry too much about things (drugs, sex, failure, etc.).
My note-taking and spelling are holding me back.
I can't see how some of the courses which I am taking are going to help me in the future.

To Arrange an Appointment

Students need only call or come to the center to request an appointment. The center's receptionist will arrange a brief conference with one of the counseling staff. This conference allows the center ot determine how to be of maximum help to the student, to answer any questions he may have about the center and its operations, and to make additional appointments when the student and counselor feel it is appropriate.

About 25 per cent of all University students make use of Counseling Center services during their years of enrollment. There is no fee for University undergraduates or graduate students. Non students receive counseling, testing, and educational skills services for a nominal fee as staff time allows.

The Counseling Center is located in the Shoemaker Building, just behind the Chapel. Telephone: 454-2931.

JUDICIARY OFFICE

The University Judiciary Office effects discipline of the undergraduate students. Under the framework of a judiciary program which emphasizes personal growth and development, the aims of judicial actions are largely educative and preventive. Judiciary Office staff members review all reports of alleged misconduct, contact those individuals involved and in most instances schedule the case for hearing by a student judicial board.

Staff members are available from 8:30 a.m. to 4:30 p.m. Monday through Friday to discuss any aspect of a disciplinary situation with the student charged, witnesses or those bringing the charges.

PLACEMENT AND CREDENTIALS SERVICES

The primary objective of the Placement Office is to encourage and assist all students—underclassmen as well as seniors, graduate students and alumni—to explore their abilities and interests as they concurrently explore employers, needs, economic and occupational trends.

Career advisors, programs, services and facilities are geared towards broadening students' knowledge of graduate school, government, education, business, and industry. An excellent resource is the Career Library (Room 26 of the Placement Office), which contains an extensive collection of occupational information, graduate and professional school bulletins, summer, permanent, and non-degree job opportunities in various fields, general career information, and reference materials on nearly 1,000 major employers.

Seniors within two semesters of graduation are encouraged to participate in the on-campus interview program. Over 500 employers conduct interviews in the Placement Office from late October to early April. Further details on this program are available in the Placement Office.

A Credentials Service is provided for College of Education seniors interested in teaching and for graduate students applying for teaching, administrative or research positions in schools and colleges. Please turn to the education section of this catalog for details.

Placement and Credentials Services is located in Cumberland Hall basement; the phone is 454-2813.

INTERNATIONAL EDUCATION SERVICES AND FOREIGN STUDENT AFFAIRS

The Office of International Education Services provides a wide variety of services designed to assist foreign students to make the necessary adjustment to American university and community life and to help them derive the maximum benefit from their experience in the United States. Services include advising on admission to the University, issuance of immigration documents, special orientation programs, emergency loans, assistance with securing housing, information about educational, cultural, and social opportunities, and personal advising. Some of these services are available also for visiting foreign faculty. For American students, the Office provides information about opportunities for travel and study abroad.

Regulations Affecting Foreign Students

Foreign students are subject to the same regulations that govern the academic life and personal conduct of American students enrolled in the University. In addition, foreign students are required:

1. To have a *medical examination* at the University Health Service before completing registration procedures.
2. To obtain approved *hospital-medical insurance* in addition to paying the University infirmary fee required of all students.
3. To attend the *special orientation program* for new foreign students enrolling for the first time in September or February. (This program is held during the week prior to registration.)

Foreign students are also subject to special regulations of the U.S. Immigration Service and the U.S. Department of State which establish the conditions under which students may enter the United States and remain in this country for the purpose of pursuing studies. The Office of International Education Services and Foreign Student Affairs has the responsibility for advising students on these and other matters, as well as for issuing documents needed to maintain proper immigration status.

The following regulations should be kept particularly in mind by students holding an F and J visa:

1. Permission for temporary stay in the United States is valid for only one year at a time and must be revalidated from one month to two weeks prior to the date of expiration.
2. A full course of study must be maintained.
3. Employment off-campus during the academic year may not be engaged in without the prior approval of the Immigration Service in the case of F-1 students, or the permission of the sponsor designated in the Exchange-Visitor Program in the case of J-1 students. The same regulations govern the securing of practical training.

   Permission for off-campus summer employment or on-campus employment during the academic year may be granted by the Director of International Education Services and Foreign Student Affairs on this campus.

   Under no circumstances may the wife or dependent with an F-2 visa classification accept employment. The wife or dependent with a J-2 classification may request the Immigration Service for permission for employment if the financial resources of the J-1 student are not adequate for the support of the wife or dependent.
4. An annual address report must be made to the Immigration Service during the month of January by immigrant as well as non-immigrant students (except those with A or G classification). Address report cards are available during the month of January only at U.S. post offices.

Information, forms and assistance in making necessary arrangements for complying with the regulations mentioned above are available at the Office of International Education Services and Foreign Student Affairs. Information regarding the filing of income tax returns may also be secured from the same office.

CULTURAL STUDY CENTER

The Cultural Study Center was established for the purpose of studying minority and other student cultural subgroups at the University of Maryland. Research covers the socio-economic background and psychological development of the particular students, as well as their experiences on campus, which include admissions, attrition, academics, adjustments, and problems of student life. Initially, the center is developing data that bear on the interface between black and white cultures, on and off campus, and that point to changes that can be made at the University.

The center is serving as a clearing house of research dealing with black culture and is establishing a modest library.

The center has an advisory board consisting of black college and high school students, faculty and administrators, government officials, and members of the black community reflecting diverse viewpoints. University of Maryland Eastern Shore, a predominantly black institution, also participates on the board.

The Cultural Study Center is located in Shoemaker Building, telephone 454-4698.

STUDENT ORGANIZATIONS

Over three hundred officially recognized special interest clubs, civic groups, service, professional and recreational organizations, religious clubs, and musical groups are available at College Park. These organizations serve the important function of encouraging the development of leadership, integrity and citizenship skills.

Channels for student activities include six student communications and publications media, over a dozen musical groups, the various social organizations, athletics and the Student Government Association.

The Student Activities Department within the Student Affairs Division of the University of Maryland, is concerned with facilitating learning and personal growth in the widest sense for all students. To this end, its professional staff has made a team commitment to designing a broad spectrum of experiences relevant to the current lives, goals and needs of students.

The staff acts as consultants and resource people to the University community in all aspects of cocurricular experiences. The programs which they offer focus on leadership, communications, group techniques, and human relations skills. The success of their programs depends on their ability to involve students in the entire process of planning, implementation and evaluation of the programs as they work closely with the staff. They invite the entire University community to become involved with them in creating a better total educational experience for the students of the University of Maryland.

The Student Activities Department staff consists of eight full-time professionals. These people occupy the following positions:

Director of Student Activities—Rm. 140 Student Union.

Director of Orientation—Rm. 140 Student Union.

Director of Cultural Affairs—Room 103 Student Union.

Director of Community Service Programs—Rm. 142B Student Union.

Educational Programming Specialists—Rm. 136, Rm. 142 Student Union.

Assistant to the Director of Student Activities—Rm. 136 Student Union.

STUDENT GOVERNMENT ASSOCIATION

The Student Government Association consists of three parts: executive, legislative and judicial.

The executive branch acts as a coordinator of student activities and services at Maryland. The legislative branch is responsible for investigating and providing solutions for problems concerning students. The judicial branch of SGA protects student rights and punishes those who violate University rules.

Under the Student Government Association are numerous committees which organize the affairs and activities of the student body. Membership is open to all interested students and applications may be secured from the SGA Office, Rm. 104 in the Student Union. SGA Committees include: Cultural Committee, Finance Committee, Homecoming, International Club, Placement Committee, Free University Committee, and Student Union Board.

The Student Government Association's Cultural Committee, University Theatre, and musical groups present a broad program of musical, cultural, and dramatic programs. The National Symphony presents a series of four concerts during the year. Contemporary entertainment is presented throughout the year by various student organizations.

PACE (People Active In Community Effort)

College students throughout the United States today are increasingly seeking a means of becoming involved in activity that has a direct relevance to problems and issues facing our domestic communities.

University of Maryland students and faculty have taken action in the creation of strong, dynamic community service volunteer programs. PACE is the organization that serves as the coordinating organ for such programs as "Volunteers for Mental Health" and "Upward Bound."

A staffed office located in Rm. 101 Student Union is maintained as the focal point for all projects. Telephone: 454-4275.

Greek System

The Interfraternity and Panhellenic Councils are the governing bodies for the Greek system, which consists of 45 fraternity and sorority houses. It is the objective of the houses to encourage individual members in the development of values, maturity, academic and intellectual potential, and leadership ability.

A varied program is carried out by the Greek system annually, often to the benefit of the entire student body as well as fraternity and sorority members. The IFC Ball, one of the few remaining formal events of the year, is held during semester break and features well-known entertainers and bands. Retreats are held each semester and are designed to study in depth, problems facing the system and the University or to provide leadership training.

University Commuters' Association

The University Commuters' Association offers the commuter many opportunities to become involved in campus life and provides unity to the large group of students who commute from nearby apartments and homes.

The Commuters' Den and the UCA Office are located in the Student Union. The Den serves as a convenient place for commuters to eat, chat with friends, or just relax between classes, away from the bustle of the large campus.

Associated Women Students

The Associated Women Students (AWS) is the governing body for women students on the University of Maryland campus. All full-time women students are members of the organization.

AWS program and policy are administered by three councils: The Executive Council, President's Council and Panhellenic Council. AWS is an active affiliate of the Inter-collegiate Association of Women Students, the national women's student government organization.

Annually, AWS sponsors educational programs like the Sex Symposium, Drug Symposium, Women's Career Symposium, and Bridal Fair. These programs include informative lectures often by nationally known speakers, discussions, films or displays.

University Information Center

The University Information Center is operated by the Student Activities Department to provide information about University programs, services and facilities.

The Center is open from 10:00 a.m. to 4:00 p.m. Monday through Friday and is located in the Student Union Main Lobby, Room 111.

Student Publications

Student publications produced regularly include the Diamondback, Terrapin, Calvert, Argus, The Greek, and the Course Guide.

Any publication or pamphlet published by a student organization or group must be approved in advance by the Adjunct Senate Committee on Student Publications and Communications.

Registration of University Events

The Activities Coordinator (Rm. 142, Student Union) is responsible for the registration of certain University events.

New Student Organizations

Any student or group wishing to organize a University-recognized club or activity should obtain a copy of the Student Organization Directory which explains the procedure for formal recognition by the Student Government Association and the Adjunct Committee on Student Activities of the University Senate. Members of the Student Activities staff are available to talk with students about organizations.

Calendar Registration

The SGA Calendar of Events is the publication through which events can be publicized on a campus-wide, semester basis. These events must be registered in Room 136, Student Union by May 30

for inclusion in the fall calendar and by January 15 for the spring calendar.

Religious Programs

The religious community at the University of Maryland presents a diversity of tradition through the several chaplaincies on campus. A cooperative ministry is carried out by these chaplaincies. In a number of instances during the year the Protestant, Romanc Catholic, and Jewish chaplaincies jointly sponsor activities and programs of mutual interest and concern. All of the groups maintain active religious and social programs for their students.

Offices for most of the Protestant chaplains are located in the University Chapel. The Roman Catholic and Jewish groups maintain their own centers off campus.

ATHLETICS

The University of Maryland Athletic Department, under the direction of Director Jim Kehoe, fields varsity teams in football, soccer, and cross country in the fall; basketball, swimming, wrestling, and indoor track during the winter; and baseball, golf, tennis, lacrosse, and outdoor track in the spring. Freshman schedules also prevail in football and basketball. Maryland is a member of the Atlantic Coast Conference, which also includes Clemson, Duke, North Carolina, North Carolina State, South Carolina, Virginia, and Wake Forest. The University has won the Carmichael Cup, symbolic of top overall athletic performance in the ACC, in all except two of the first nine years the trophy has been in existence.

The Men's Intramural Department provides competition in touch football, horseshoe, tennis, and cross country during the fall; basketball, bowling, weight lifting, swimming, badminton, table tennis, volleyball, and wrestling in the winter; and foul shooting, softball, soccer, golf, and track during the spring months. All regularly enrolled full-time male undergraduates are eligible to participate by submitting entry blanks before posted deadlines. Blanks may be obtained from Intramural Director Nick Kovalakides. His office is located in Reckord Armory. Interested students are urged to stop by the office to obtain a copy of the intramural handbook.

MOTOR VEHICLES

Parking facilities at the University are extremely limited and are primarily intended for use by commuting students. Most parking areas are located on the periphery of the campus and are usually five or six blocks away from residence halls and classroom buildings.

Freshman and sophomore resident students are not permitted to register motor vehicles on campus; however, they may obtain on-campus weekend parking privileges. Any freshman or sophomore (i.e., a student who has earned fewer than 56 academic credits) who needs a motor vehicle for work, or for any other purpose, should consider making off-campus living arrangements.

Motor scooters, motorcycles, motor-bikes, or bicycles are not permitted inside any residence hall. They must be parked in those outside areas specifically marked for them.

COMMISSIONS FOR THE VICE CHANCELLOR FOR STUDENT AFFAIRS

In the interest of trying to draw on collaborative efforts and to improve various segments of campus life, the Vice Chancellor of Student Affairs several years ago established a series of commissions. The commissions are task-oriented groups who identify problem areas, study them, gather relevant information, and then make periodic proposals for change to the Vice Chancellor. The Commissions typically have twelve members—half of the members are students, one-fourth are Student Affairs staff, and one-fourth are faculty.

The areas of student life with which the commissions concern themselves are the following:

Commission I:	Transition to the University
Commission II:	Transition from the University
Commission III:	Residential Campus Life
Commission IV:	Commuter Campus Life
Commission V:	Student-Faculty Relationships
Commission VI:	Student-Administration Relationships
Commission VII:	Student-Student Relationships
Commission VIII:	Campus Facilities
Commission IX:	Black Students

Interested individuals are requested to contact the Coordinator of the Commissions by calling 2931 or 2925.

RESIDENCE HALLS

The goals and objectives of the University of Maryland Residence Halls Program are based upon and congruent with the goals of the University. The work of the residence halls staff occurs in the mainstream of the total educational enterprise. Therefore, the primary function of the Residence Halls Program is to assist students in learning and growing as fully functioning persons and to develop their intellectual, emotional, interpersonal, and physical capacities.

The residence halls are divided into five geographic areas: Cambridge, Denton, Ellicott, Hill, and Mobile. Assistant Directors of Housing are responsible for the development of an educational atmosphere within the individual areas, supervision of the staff personnel and coordination of all area activities.

The residence halls staff is composed of Resident Directors, Graduate Residents and Resident Assistants. They are responsible for facilitation of an educational environment, administration and overall supervision of the hall. They perform such functions as assisting in program development, consulting with individual students, and advising student government, house and area judiciaries, and student committees.

The University Housing Office, including the offices of the Director and Associate Directors of Housing, is located in the North Administration Building. The Assistant Directors of Housing for residential areas maintain offices within their respective areas.

RESIDENCE HALLS GOVERNMENT

Residence halls government has three main functions: (1) to provide for the comfort and safety of the student through the enforcement of common ethical and safety codes, (2) to provide social, cultural, athletic, and intellectual programs for the enjoyment and development of the student, and (3) to provide opportunities for students to gain leadership experience and develop responsibility.

All residents are members of the residence hall student government and, as members, are asked to pay dues at the time they enter the residence hall. These house activities dues are established by a majority vote of the students in each residence hall and are collected by student officers. Each Area Council shall assess by majority vote of the Council the amont per person which is to be paid to the Area Council.

AREA GOVERNMENT OR COUNCILS

With a geographically divided residence halls system, and with a desire on the part of the student leaders to work together for the common good, a system of geographical area governments exists. The structures of the governments differ from area to area.

The purpose of the Area Government is to stim-

ulate personal growth, as well as intellectual, cultural, social, and athletic interaction on an area-wide basis.

RESIDENCE HALLS ASSOCIATION

The Residence Halls Association serves as the student governmental, coordinating body for all residence halls. It is composed of the presidents and elected representatives of all of the area governments. The officers of the Residence Halls Association are annually nominated and elected by the residence halls presidents.

RESIDENCE HALLS CONTRACT

The residence halls contract is binding for the entire academic year except for students entering the residence halls in the spring semester, when it is binding for the one semester only. Release from contract is permitted under extenuating circumstances or upon withdrawal from the University.

Only single, full-time undergraduate students may live in the residence halls. The resident shall comply with the rules and regulations of the University and of the residence hall in which he lives. All students are responsible for adherence to the University regulations set forth in all official publications.

The University reserves the right to: (1) change the room assignment of a student or request him to move to different accommodations and (2) inspect residence hall student rooms in accordance with the room inspection policy.

The following shall constitute grounds for termination of the contract by the University: default in payments, withdrawal from the University, academic dismissal, disciplinary dismissal (violation of University and/or residence halls rules and regulations), or conduct on the part of the student by which the removal of that student from the residence halls would be in the best interest of the other residents. The University will give the student a written notice stating the date of termination of the contract.

The University does not permit a student to sublet a residence hall room.

Room refunds will be made in accordance with the established University refund policy when a student withdraws or is dismissed.

Room charges begin with the first day of registration and include the last day of each semester.

The room contract is binding for the entire year. No part of the charge for room is refundable except where the student officially withdraws from the University or where he is given permission by the appropriate officials of the University to move from the residence halls. Students authorized to withdraw from the residence halls will receive a room refund on a pro rata weekly basis computed from the date the student turns in his room key to his staff member and properly clears his room. No room refunds will be made after the fourteenth week of the semester. A service charge will automatically be deducted from all room refunds.

The residence halls are closed during the Thanksgiving, Christmas, between semesters, and spring recesses. Students must make their own arrangements for housing accommodations at these times. Designated residence halls may remain open during these periods, if there is sufficient need.

Students will be billed for all damages or loss they cause to University buildings, fixtures, furnishings, equipment, or other property.

Group living requires that students conform to certain standards of conduct. Any student who fails to observe these standards may be referred for disciplinary action including possible dismissal from the residence halls.

ENTRY AND INSPECTION OF STUDENT ROOMS

Staff members are to be cognizant of the need for sanitary, safe and comfortable living conditions in the residence halls. Staff members are required to inspect the grounds and public areas of their buildings thoroughly at least once each week. They should be on the alert and immediately initiate action for correction of any existing safety or health hazards.

Students are responsible for the cleanliness and order of their rooms. Problems involving maintenance, safety, individual rights, and general administration which come to our attention through complaints from roommates, other students, hall officers, or maintenance personnel will be handled on an individual basis. The staff member will take no inspection action without consultation with the Area Manager, Assistant Director and a hall student government official. If after such consultation it is determined that an inspection of a student's living quarters is warranted, the following guidelines will be observed:

1. A hall student government official will be informed and requested to assist in the inspection and correction of the situation.
2. The occupants will be advised of the time of the inspection and at least one occupant will be required to be present.
3. The staff member will be accompanied by a student, preferably a hall officer.
4. No search will be conducted and no personal possessions will be handled.
5. A written report of the inspection will be made in triplicate (one copy for the occupants, one copy for the Assistant Director or the Area Manager and one copy to be retained by the staff member).

The University reserves the right to enter student rooms during the break between semesters, Thanksgiving, Christmas, and Easter for purposes of routine maintenance, cleaning, and extermination. Regular closing procedures will include notifying students that their rooms may be opened for these purposes.

PERSONAL PROPERTY: LOSS, THEFT AND INSURANCE

The University accepts no responsibility for the damage, theft or loss of monies, valuables or any personal properties. Resident students and staff are cautioned to use all necessary preventive measures against any loss or damage of personal property. To guard against such loss, doors should always be locked. It is advisable to make arrangements for the protection of valuables when leaving campus for an extended period of time. If there is a loss, it should be reported immediately.

Neither the State nor the University provides any insurance coverage on property owned by students, faculty, staff, or employees. It is expected that individuals will provide insurance to protect themselves from losses to all forms of personal property which may be located on University premises.

RESIDENCE HALLS REGULATIONS

In addition to the University regulations which apply to all students, the following residence halls regulations concerning safety, sanitation and individual freedoms have been established with the welfare of each student in mind.

1. Open flame devices such as lighted candles, lanterns, stoves, torches, etc., must not be used within the residence halls.
2. Electrical appliances and extension cords are not approved for use within the residence halls unless it is established that they do not overload electrical circuits and create a fire hazard.
3. As a fire-preventive measure, students are requested to use metal wastebaskets and to use ashtrays that permit a cigarette to be held in a ridged device in the center.
4. Each time a building alarm sounds, regardless of cause, every person must leave the building immediately by the shortest route. Elevators are not to be used because of possible power failure.
5. Animals or pets are not permitted in the residence halls.
6. Cleanliness and sanitation are essential in the use of residence hall kitchens. Students are responsible for kitchen maintenance.
7. Foods should be stored under proper refrigeration, in covered containers, and should be discarded if not used within a short period. Food should never be stored in paper containers.
8. No soliciting is permitted in the residence halls without special written permission from the Director of Housing in consultation with the appropriate assistant director.
9. Removal or relocation of residence halls property is not permitted unless authorized by the appropriate area manager or assistant director of housing.

The residents, acting through governmental unit voting, may desire to establish additional standards of conduct.

ROOM ASSIGNMENT

Residence hall room assignments are initially made on a random basis. Roommate and hall preferences are not honored in the assignment of new students. A student may not transfer from the initial room assignment to another room assignment until the beginning of the third week of classes. Hall and roommate preferences are honored for students returning to the residence halls after their first academic semester. These room assignments are based on individual preference in accordance with priorities established by the residents of each hall (class rank, length of occupancy, academic standing, leadership, etc.).

OPEN HOUSE PROGRAM

The Open House Program provides opportunities for coeducational activities in residence halls and allows increased opportunity for students to develop personal responsibility and maturity. Male and female students and other guests may utilize all facilities of the residence hall during a time period specifically established for such a program. The time period may not conflict with the established calling hours in residence halls.

1. The Open House Program in each residence hall is approved and the hours are established by a three-fifths majority vote of the total membership of the unit. All members of each residence hall unit shall vote by secret ballot on existing hours at the beginning of each semester. Either expansion or shortening of the hours may be brought before the unit for consideration by a petition of one-fourth of the students of the residence hall unit. Planning, scheduling and evaluating of the Open House Program is a cooperative effort of students and staff members.
2. The maximum hours within which open houses may be held are:

   Sunday through Thursday:
   12:00 noon-12 midnight
   Friday and Saturday: 12:00 noon-1:30 a.m.

   Certain designated halls may hold open house within the following hours:

   Sunday through Thursday:
   8:00 a.m.-12:00 midnight
   Friday and Saturday: 8:00 a.m.-1:30 a.m.
3. The residence hall staff member regularly on duty together with student leaders will supervise the program.
4. The president of the hall will record the days and hours as adopted by the unit and submit them to the staff member for posting.
5. Designated representatives of the unit student government will be present during open house.
6. The host must meet the guest in the lobby of the hall and escort that guest to the lounge,

study room, recreation room, or student room. The host assumes responsibility for the behavior of the guest.

7. An announcement should be made prior to the beginning and ending of the open house period.
8. All rules and regulations of the University and of the residence halls must be observed at all times.
   a. It is the responsibility of the host to observe and to adhere to the limiting hours established by the campus-wide Open House Program. If a visitor is in the hall either before or after these hours, then both the host and the visitor will be referred to the Judiciary Office.
   b. If the hall sets visiting hours which fall within the limits of the campus-wide program, then violations of these hours will be referred to the Hall or Area Judicial Board for appropriate action.
   c. In cases where the guest is not a University student, then the host must assume full responsibility for the guest's behavior.

LOBBY VISITATION

Effective upon passage by the required vote in each hall, lobbies in residence halls where night receptionists are on duty will be open for increased time periods. The rationale for this opportunity is to provide additional facilities for student interaction.

The following provisions are designed to assist in the fair and successful implementation of the lobby visitation:

1. Lobby visitation may be instituted on any night and with no time limitation in halls where night receptionists are on duty.
2. Each hall will vote to decide the hours and nights of lobby visitation. A three-fifths vote by secret ballot of all residents of the hall will be necessary to implement the program. A record of the approved nights and hours should be forwarded to the appropriate assistant director.
3. For reasons of security and privacy, lobby visitation should be limited to those rooms or areas near where the night receptionist is on duty.
4. After closing, visitors must (a) have a host and (b) leave some form of identification with the night receptionist on duty.

CALLING HOURS

Calling hours in the main public areas of each residence hall, sorority house and fraternity house shall be determined by an all-unit vote. These hours must fall between 9:00 a.m. and midnight, Sunday through Thursday, and 9:00 a.m. and 1:30 a.m. Friday and Saturday. Each unit will establish and post its own hours within these limits (exception, see Lobby Visitation).

SELF LIMITED HOURS PROGRAM

Women may leave or return to the residence hall after the building is locked at the closing hour. When entering or exiting, however, the main or designated door of the living unit must be used. After the closing hour, women will be admitted to the residence hall upon presentation of the student identification card to the night receptionist on duty.

When parents express to the Vice Chancellor for Student Affairs their written objections to participation in the self limited hours program, the privilege will be withheld.

Facilities are provided for students who wish to sign out and in. This aids the staff member in locating a student in case of an emergency or in delivering an important message.

GUESTS IN RESIDENCE HALLS

An overnight guest in the residence hall must be registered with the residence hall staff member in advance of or upon arrival. Guest are considered visitors who will reside in a residence hall for a maximum period not to exceed four calendar days, with limited renewal privileges only by special permission of the resident director. When a guest exceeds the four day maximum visitation period without permission, the host and the guest, if a University student, will be subject to judiciary action.

It is the responsibility of the student host to have the guest sign the overnight guest registration form. The host must receive advance permission for use of a student bed from the student whose room and bed will be used. This student will also sign the overnight guest registration form in order to signify that his permission has been given.

The host assumes the responsibility for informing a guest of University and Residence Halls regulations and policies. The guest who does not observe these regulations may be refused readmission to the residence halls as a guest.

A guest has free access to and from the residence hall, but must present identification upon request to the staff member at the desk or the staff member on duty.

Any student who has been dismissed from university housing or the University of Maryland for disciplinary reasons may be refused admission as a guest in the residence halls.

OFF-CAMPUS HOUSING

The Off-Campus Housing Office maintains files of rooms, apartments and houses for rent. Rooms rent for approximately $45 to $60 a month, depending on the accommodations offered. An apartment may be shared for $50 to $65, and houses usually rent from $200.

The office maintains listings within a ten mile

radius of the University. It is best to use the files about three to four weeks before the facilities are needed.

University owned married graduate housing is available on a priority basis as follows: teaching assistant, research assistant, married graduate students, and married undergraduates. The costs are as follows:

Efficiency $82-$87, One Bedroom $92-$103, Two Bedroom $110-$115. Utilities included. 12-month lease. Some units air-conditioned. Efficiency apartments are for single graduate students only.

For further information contact:

University of Maryland Apartments
Rental Office
3424 Tulane Drive
Hyattsville, Maryland 20783
Attention: Mr. Robert Hanna
Phone (301) 422-7445

The Off-Campus Housing Office is located in Room 208 of the Turner Laboratory (across U.S. 1 from the police station) and is open from 8:30 a.m. to 4:30 p.m., Monday through Friday. The phone number is 454-3645. During the months of July and August, the listings are available on weekends in the West Lobby of the Student Union.

University policy prohibits landlords listed by this office from discriminating because of race, religion, ethnic group, or national origin.

The University does not assume any responsibility for the inspection, supervision, cleanliness, or operation of off-campus housing.

FOOD SERVICE

The purpose of the University Food Service is to provide nutritionally balanced and tastefully prepared meals, serviced in an atmosphere that engenders good will, trust and cooperation between student and management.

THE DINING ROOM

The University of Maryland Food Service offers the student a choice of: 1) Purchasing a full board contract that will be in effect from the first day of registration through the final day of exams. It will include twenty (20) meals per week with no restrictions on seconds, except on "Special" nights. NO food may be removed from the dining hall. Violation of the latter may result in the cancellation of the offenders food contract. Student preferences will be considered whenever possible in menu planning. 2) Electing a cash option. In which case, the food service will provide, where feasible and according to available space, a cash a la carte service. Food service tries to tailor this service to meet the students desires as to menu items offered and prices will be competitive with local food establishments. All dining service will be cafeteria or scramble systems and self-bussing of trays will be required.

MEAL HOURS

	Mon.-Fri.	*Sat.*	*Sun.*	*During Finals*
Breakfast	7:00-9:30	7:30-9:30	9:00-11:00	7:00-9:30
Lunch	10:45-1:15	11:30-1:00		10:45-1:15
Dinner	3:45-6:15	4:30-6:00	2:00-4:15	3:30-6:30

Pre-exam study day and holidays—Saturday hours will prevail.

Meal hours for cash service will be developed according to the needs and demands. Meals for full board and cash customers will not be offered in the same dining room, and there will be no separate meal tickets sold for the full board dining room. However, a student wishing to invite his (her) parents for a meal may make special arrangements with the dining hall manager. In this case the Food Service department will consider the parents as invited guests. The full board contract is not restricted to resident students but is offered to any bonafide undergraduate or graduate student of the University of Maryland. When the charge for full board is established, three prime factors are used: 1. Current labor cost; 2. Current food prices; 3. Missed meal factor, based on previous experience.

The Dining Halls are closed on Thanksgiving recess, Christmas recess, between semesters and Easter recess. They are open during all other holidays.

HONORS

SCHOLARSHIP HONORS—Final honors for excellence in scholarship are awarded to one-fifth of the graduating class in each College. "HIGH HONORS" are awarded to the upper half of this group; "HONORS" to the lower half. To be eligible for honors, a student must complete at least two years of resident work (60 semester hours) at the University with an average of B (3.0) or higher.

MILTON ABRAMOWITZ MEMORIAL PRIZE IN MATHEMATICS—A prize is awarded annually to a junior or senior student majoring in mathematics who has demonstrated superior competence and promise for future development in the field of mathematics and its applications.

ALPHA CHI SIGMA AWARD—The Alpha Rho Chapter of the Alpha Chi Sigma Honorary Fraternity offers annually a year's membership in the American Chemical Society to the senior majoring in Chemistry or Chemical Engineering whose average has been above 3.0 for three and one-half years.

ALPHA LAMBDA DELTA AWARD—Presented to the senior member of the group who has maintained the highest average for three and a half years. She must have been in attendance in the institution for the entire time.

ALPHA LAMBDA DELTA SENIOR CERTIFICATE AWARD—Senior members of Alpha Lambda Delta, honorary scholastic society for women, who have maintained an average of 3.5, receive this certificate.

ALPHA ZETA MEDAL—The Professional Agricultural Fraternity of Alpha Zeta awards annually a medal to the agricultural student in the freshman class who maintains the highest average in academic work.

ALUMNI HAMILTON AWARD—This award is offered by the Hamilton Watch Company to the graduating senior in the College of Engineering who has most successfully combined proficiency in his major field of study with achievements—either academic. extra-curricular, or both—in the scocial sciences or humanities.

AMERICAN ASSOCIATION OF UNIVERSITY WOMEN ANNUAL GRADUATE PRIZE.

AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS AWARD—Free memberships in the Institute for one year and cash prizes for the best paper presented at a Student Branch meeting and for the graduating aeronautical senior with the highest academic standing.

AMERICAN INSTITUTE OF CHEMICAL ENGINEERS AWARD—A certificate, pin and magazine subscription are awarded to the junior member of the Student Chapter who attained the highest overall scholastic average during his freshman and sophomore years.

AMERICAN INSTITUTE OF CHEMISTS AWARD—Presented for outstanding scholarship in chemistry and for high character.

AMERICAN SOCIETY OF CIVIL ENGINEERS AWARD—The Maryland Section of the American Society of Civil Engineers awards annually the first year's dues of an asociate membership in the Society to a senior member of the Student Chapter on recommendation of the faculty of the Department of Civil Engineering.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS AWARD—Presented to the Senior member who contributed most to the local chapter.

AMERICAN SOCIETY FOR METALS.

APPLEMAN-NORTON AWARD IN BOTANY—The Department of Botany offers a scholarship award of $100 in honor of Emeritus Professors C. O. Appleman and J. B. S. Norton to a senior major in Botany who is considered worthy on the basis of demonstrated ability and excellence in scholarship. The scholarship is awarded by the committee on scholarships upon the recommendation of a committee of the faculty of the Department of Botany.

ASSOCIATED WOMEN STUDENTS AWARDS—Presented for outstanding achievement, character, and service to the University.

DINAH BERMAN MEMORIAL MEDAL—The Dinah Berman Memorial Medal is awarded annually to the sophomore who has attained the highest scholastic average of his class in the College of Engineering. This medal is given by Mr. Benjamin Berman.

B'NAI B'RITH AWARD—The B'nai B'rith Women of Prince Georges County present a Book Award for excellence in Hebrew Studies.

BUSINESS EDUCATION AWARD OF MERIT—To a student in Business Education in recognition of outstanding achievement as a student.

CITIZENSHIP PRIZE FOR MEN—President Emeritus H. C. Byrd of the Class of 1908, annually presents this award to the member of the senior class who, during his collegiate career, has most nearly typified the model citizen and who has done most for the general advancement of the interests of the University.

CITIZENSHIP PRIZE FOR WOMEN—This prize is presented annually as a memorial to Sally Sterling Boyd, by her children, to that member of the senior class who best exemplifies the enduring qualities of the pioneer woman. These qualities typify self dependence, courtesy, aggressiveness, modesty, capacity to achieve objectives, willingness to sacrifice for others, strength of character, and those other qualities that enabled the pioneer woman to play such a fundamental part in the building of the nation.

THE CARROLL E. COX GRADUATE SCHOLARSHIP AWARD IN BOTANY—To the outstanding graduate student in the Department of Botany during the last year.

BERNARD L. CROZIER AWARD—The Maryland Association of Engineers awards a cash prize of twenty-five dollars to the senior in the College of Engineering who, in the opinion of the faculty, has made the greatest improvement in scholarship during his stay at the University.

VIRGINIA DARE AWARD—The Virginia Dare Extract Company awards annually a plaque and $25.00 to the outstanding student in ice cream manufacturing with an overall good standing in dairy.

THE DANFORTH FOUNDATION AND THE RALSTON PURINA AWARDS—The Danforth Foundation and the Ralston Purina Company of St. Louis offer two summer awards to outstanding men students in the College of Agriculture, one for a student who has successfully completed his junior year, the other for a student who has successfully completed his freshman year. The purpose of these awards is to bring together outstanding young men for leadership training.

The Danforth Foundation and the Ralston Purina Company of St. Louis offer two summer awards to outstanding Home Economics women students, one to a junior and one to a freshman. The purpose of these is to bring together outstanding young women for leadership training.

DELTA DELTA DELTA MEDAL—This sorority awards a medal annually to the woman who attains the highest average in academic work during the sophomore year.

DELTA GAMMA SCHOLARSHIP AWARD—This award is offered to the woman member of the graduating class who has maintained the highest average during three and one-half years at the University.

DELTA SIGMA PI SCHOLARSHIP KEY—This award is offered to a member of the graduating class who has maintained the highest scholastic average for the entire four-year course in the College of Business and Public Administration.

NATHAN L. DRAKE AWARD—Presented by the Alpha Rho Chapter of Alpha Chi Sigma to the most promising student who is majoring in chemistry and has completed the sophomore year.

EDUCATION ALUMNI AWARD—Presented to the outstanding senior man and senior woman in the College of Education.

GENERAL ELECTRIC COMPANY prize to the outstanding first year graduate student in physics and to the outstanding first year graduate student in astronomy.

GODDARD MEDAL—The James Douglass Goddard Memorial Medal is awarded annually to the resident of Prince Georges County born therein, who makes the highest average in his studies and who at the same time embodies the most manly attributes. The medal is given by Mrs. Anne G. Goddard James of Washington, D.C.

CHARLES B. HALE DRAMATIC AWARDS—The University Theatre recognizes annually the man and woman members of the senior class who have done most for the advancement of dramatics at the University.

THE HASKINS AND SELLS FOUNDATIONS, INC., AWARD to the senior student in the College of Business and Public Administration concentrating in accounting who has demonstrated excellent ability in this field of study.

HOME ECONOMICS ALUMNI AWARD—Presented to the student outstanding in application of home economics in her present living and who shows promise of carrying these into her future home and community.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERING AWARD—The Washington Section of the Institute of Electrical and Electronics Engineers defrays the expenses of a year's membership as an associate in the Institute for the senior doing the most to promote student branch activities.

JOE ELBERT JAMES MEMORIAL AWARD—Gold watch annually awarded to the graduating senior in horticulture on basis of scholarship and promise of future achievement.

LEIDY CHEMICAL COMPANY AWARD to an outstanding student majoring in chemistry.

MARYLAND BANKERS ASSOCIATION SCHOLARSHIP to the Virginia-Maryland Bankers Schools, University of Virginia. Awarded annually to a student majoring in finance in the College of Business and Public Administration.

MARYLAND-DELAWARE PRESS ASSOCIATION ANNUAL CITATION—Presented to the outstanding senior in journalism.

MARYLAND RECREATION AND PARKS SOCIETY AWARD to outstanding senior majoring in recreation.

THE MEN'S LEAGUE AWARD to the male senior who gave the most to sports.

MEN'S LEAGUE CERTIFICATES—Offered for outstanding achievement, character and service to the University.

MEN'S LEAGUE CUP—This award is offered by the Men's League to the graduating male senior who has done the most for the male student body.

MOTOR FLEET SUPERVISORS AWARD to a student majoring in transportation in the College of Business and Public Administration.

NATIONAL SOCIETY OF FIRE PROTECTION ENGINEERS AWARDS—Presented to the most outstanding senior and sophomore in the fire protection curriculum.

NOXZEMA CHEMICAL COMPANY SCHOLARSHIP AWARD to an undergraduate student in chemistry.

OMICRON NU SORORITY MEDAL—This honorary sorority awards a medal annually to the freshman woman in the College of Home Economics who attains the highest scholastic average during the first semester.

PHI BETA KAPPA JUNIOR AWARD—An award to be presented to the junior initiate into Phi Beta Kappa who has attained the highest academic average.

PHI BETA KAPPA—LEON P. SMITH AWARD—The award of the Gamma of Maryland Chapter of Phi Beta Kappa is presented to the graduating senior with the highest cumulative scholastic average whose basic course program has been in the liberal studies.

PHI CHI THETA KEY—The Phi Chi Theta Key is awarded to the outstanding graduating senior woman in the College of Business and Public Administration on the basis of scholarship, activities and leadership.

PHI SIGMA AWARDS for outstanding achievement in the

biological sciences to an undergraduate student and a graduate student.

PI DELTA EPSILON NATIONAL MEDAL OF MERIT AWARDS—Offered by the National Council of Pi Delta Epsilon to the outstanding senior woman and the outstanding senior man in journalism activities.

PI DELTA EPSILON AWARD for outstanding service to communications in the field of broadcasting.

PI DELTA EPSILON AWARD for outstanding service to communications in the field of business.

PI DELTA EPSILON AWARD to the outstanding freshman in the field of communications.

PI DELTA EPSILON AWARD for outstanding service to communications in the field of editorial journalism.

PI TAU SIGMA AWARD—An annual handbook award to the most outstanding sophomore in mechanical engineering on the basis of scholastic average and instructors' ratings.

PILOT FREIGHT CARRIERS, INC., AWARD to the senior student in the College of Business and Public Administration who has majored in transportation and who has demonstrated competence in this field of study.

PUBLIC RELATIONS SOCIETY OF AMERICA—The Baltimore Chapter of PRSA presents an annual citation to the outstanding senior majoring in public relations.

SIGMA ALPHA OMICRON AWARD—This award is presented to a senior student majoring in microbiology for high scholarship, character and leadership.

THE SIGMA CHAPTER, PHI DELTA GAMMA AWARD To an outstanding woman who has completed requirements for the doctoral degree.

DR. LEO AND RITA SKLAR GENERAL HONORS AWARDS —Dr. Leo Sklar, A&S '37, and his wife, Rita Sklar, annually fund four awards for excellence in the General Honors Program of the College of Arts and Sciences. These awards are given to the Outstanding Student in the General Honors Program ($400), the Outstanding General Honors senior ($300), the Outstanding General Honors junior ($300), and the Outstanding General Honors sophomore ($300).

ALGERNON SYDNEY SULLIVAN AWARD—The New York Southern Society, in memory of its first president, awards annually medallions and certificates to one man and one woman of the graduating class and one non-student who evince in their daily life a spirit of love for and helpfulness to other men and women.

TAU BETA AWARD—The Maryland Beta Chapter of Tau Beta Pi Association, national engineering honor society, awards an engineer's handbook to the junior in the College of Engineering who during his sophomore year has made the greatest improvement in scholarship over that of his freshman year.

WALL STREET JOURNAL STUDENT ACHIEVEMENT AWARD—Awarded annually to the graduating senior who has maintained the highest scholastic achievement in the field of financial administration. The award consists of a silver medal embedded in clear plastic and one year's subscription to the Wall Street Journal.

AIR FORCE ROTC AWARDS

AEROSPACE EDUCATION FOUNDATION.

W. RANDOLPH LOVELACE MEMORIAL AWARD recognizes the most outstanding Air Force Association Award winner from each of the nine geographical areas.

AFROTC ANGEL FLIGHT AWARD to the outstanding freshman cadet displaying outstanding leadership and showing the most promise for the Professional Officer Course.

AIR COMMAND AND STAFF COLLEGE AWARD recognizes the most outstanding AFROTC cadet in the nation for his military and scholastic excellence.

AIR FORCE TIMES AWARD to the senior cadet at each detachment who has distinguished himself by contributing materially to constructive public attention for the corps of cadets.

ALUMNI CUP offered each year to the cadet who has achieved the highest grade point average within the corps of cadets.

AMERICAN FIGHTER ACES AWARD recognizes the outstanding graduating cadet pilot in each geographical area based on his performance and achievements as an AFROTC cadet and his performance in the Flight Instruction Program.

AMERICAN LEGION AWARDS to outstanding senior and junior cadets who have demonstrated military excellence and scholastic achievement.

ARMED FORCES COMMUNICATIONS AND ELECTRONICS ASSOCIATION to the outstanding senior cadet majoring in electrical, electronics or communications engineering.

ARMED FORCES COMMUNICATIONS AND ELECTRONICS ASSOCIATION SCHOLARSHIP AWARD to award one $500 scholarship annually to a sophomore AFROTC cadet for undergraduate or University study in electrical engineering, communications engineering and/or technical photography.

ARNOLD AIR SOCIETY AWARD to the advanced cadet selected by the Arnold Air Society as the cadet who has contributed the most to the advancement of AFROTC through activities of the Arnold Air Society.

COBLENTZ MEMORIAL CUP to the outstanding flight in the corps of cadets, by the Board of Regents of the University.

DAUGHTERS OF THE AMERICAN REVOLUTION AWARD recognizes the senior cadet displaying qualities of dependability and good character, adherence to military discipline, leadership ability and a fundamental, patriotic understanding of the importance of ROTC training.

DISABLED AMERICAN VETERANS GOLD CUP to the senior cadet who has displayed outstanding leadership, scholarship and citizenship.

DISTINGUISHED AFROTC CADET AWARDS to those seniors who possess outstanding qualities of leadership and high moral character and who meet the prescribed standings in their academic and military studies.

GENERAL DYNAMICS AWARD to the sophomore cadet displaying outstanding leadership and scholarship qualities and who has been selected for the Professional Officer Course.

GOVERNOR'S CUP to the outstanding squadron in the corps of cadets.

LEGION OF VALOR BRONZE CROSS OF ACHIEVEMENT AWARD recognizes one cadet from each geographical area for his performance and achievements as an AFROTC cadet.

NATIONAL DEFENSE TRANSPORTATION ASSOCIATION AWARD to the outstanding senior cadet majoring in transportation.

RESERVE OFFICERS ASSOCIATION AWARDS to the outstanding senior, junior and sophomore cadets at each detachment.

SOCIETY OF AMERICAN MILITARY ENGINEERS AWARD to recognize 20 junior or senior cadets nationally displaying outstanding scholastic achievement and leadership and majoring in the field of engineering.

SONS OF THE AMERICAN REVOLUTION MEDALS to a two-year and a four-year cadet displaying outstanding aptitude for the military.

ATHLETIC AWARDS

ATLANTIC COAST CONFERENCE AWARD—A plaque is awarded each year to a senior in each conference school for excellence in scholarship and athletics.

THE ALVIN L. AUBINOE BASKETBALL TROPHY—This trophy is offered by Alvin L. Aubinoe for the senior who has contributed most to the squad.

THE ALVIN L. AUBINOE FOOTBALL TROPHY—This trophy is offered by Alvin L. Aubinoe for the unsung hero of the current season.

THE ALVIN L. AUBINOE TRACK TROPHY—This trophy is

offered by Alvin L. Aubinoe for the senior who has contributed most to the squad during the time he was on the squad.

JOHN T. BELL SWIMMING AWARD—To the year's outstanding swimmer or diver.

LOUIS W. BERGER TROPHY—Presented to the outstanding senior baseball player.

WILLIAM P. COLE, III, MEMORIAL LACROSSE AWARD—This award, offered by the teammates of William P. Cole, III, and the coaches of the 1940 National Champion team, is presented to the outstanding midfielder.

THE GEORGE C. COOK MEMORIAL SCHOLARSHIP TROPHY—Awarded annually to a member of the football team with the highest scholastic average.

JOE DECKMAN-SAM SILBER TROPHY—This trophy is offered by Joseph H. Deckman and Samuel L. Silber to the most improved defense lacrosse player.

GEARY F. EPPLEY AWARD—Offered by Benny and Hotsy Alperstein to the graduating male senior athlete who, during his three years of varsity competition, lettered at least once and attained the highest over-all scholastic average.

HALBERT K. EVANS MEMORIAL TRACK AWARD—This award, given in memory of "Hermie" Evans, of the Class of 1940, by his friends, is presented to graduating senior trackman.

HERBERT H. GOODMAN MEMORIAL TROPHY—This trophy is awarded to the most outstanding wrestler of the year.

CHARLES LEROY MACKERT TROPHY—This trophy is offered by William K. Krouse to the Maryland student who has contributed most to wrestling while at the University.

MARYLAND RING—The Maryland Ring is offered as a memorial to Charles L. Linhardt, of the Class of 1912, to the Maryland man who is adjudged the best athlete of the year.

CHARLES P. MCCORMICK TROPHY—This trophy is offered by Charles P. McCormick to the senior letterman who has contributed most to swimming during his collegiate career.

ANTHONY C. NARDO MEMORIAL TROPHY—This trophy is awarded to the best football lineman of the year.

EDWIN POWELL TROPHY—This trophy is offered by the Class of 1913 to the player who has rendered the greatest service to lacrosse during the year.

SILVESTER WATCH FOR EXCELLENCE IN ATHLETICS—A gold watch, given in honor of former President of the University, R. W. Silvester, is offered annually to "the man who typifies the best in college athletics."

TEKE TROPHY—This trophy is offered by the Maryland Chapter of Tau Kappa Epsilon Fraternity to the student who during his four years at the University has rendered the greatest service to football.

ROBERT E. THEOFELD MEMORIAL—This trophy is presented by Dr. and Mrs. Harry S. Hoffman and is awarded to the golfer who most nearly exemplifies the competitive spirit and strong character of Robert E. Theofeld, a former member of the boxing team.

MUSIC AWARDS

ASSISTANT DIRECTOR'S AWARD to the outstanding member of the Symphonic Band.

DIRECTOR'S AWARD to the concert band member who demonstrated the most improvement in musicianship during the year.

KAPPA KAPPA PSI AWARD to the most outstanding band member of the year.

SIGMA ALPHA IOTA ALUMNAE AWARD for outstanding musical performance.

SIGMA ALPHA IOTA DEAN'S HONOR AWARD for service and dedication.

SIGMA ALPHA IOTA HONOR CERTIFICATE to the senior with the highest scholastic average.

SIGMA ALPHA IOTA LEADERSHIP AWARD based on personality, student activities, fraternity service, and scholarship.

TAU BETA SIGMA AWARD to the outstanding band sorority member of the year.

Awards are presented to the members of the University Bands, the University Orchestras, and the Men's and Women's Glee Clubs who serve faithfully throughout the year.

STUDENT GOVERNMENT AWARDS

Keys are awarded to the members of the SGA Legislature and Certificates of Appreciation to the members of the Cabinet.

Regulations and procedures for the awarding of scholarships are formulated by the Committee on Financial Aids. The Board of Regents of the University authorizes the award of a limited number of scholarships each year to deserving students. Applicants are subject to the approval of the Director of Admissions, insofar as qualifications for admission to the University are concerned. All recipients are subject to the academic and non-academic regulations and requirements of the University.

The recipient of the scholarship or grant is expected to make at least normal progress toward a degree, as defined by the Academic Regulations.

The Committee reserves the right to review the scholarship program annually and to make adjustments in the amount and recipients of awards in accordance with the funds available and scholastic attainment.

Some of the types of scholarships, grants and loan funds available are:

ENDOWED AND ANNUAL SCHOLARSHIPS AND GRANTS

AFROTC COLLEGE SCHOLARSHIP PROGRAM—This program provides scholarships for selected cadets each year in the four-year AFROTC program. Those selected receive money for full tuition, laboratory expenses, incidental fees, and an allowance for books for up to eight semesters. In addition, they receive nontaxable pay of $50 per month. One must be in the program at the University of Maryland before he can apply for this scholarship.

AIR FORCE WARRANT OFFICERS ASSOCIATION STUDENT AID PROGRAM—Scholarship aid has been made available by the Air Force Warrant Officers Association for worthy male or female undergraduate or graduate students in good standing, with preference given to children of Air Force Warrent Officers or other military personnel.

ALBRIGHT SCHOLARSHIP—The Victor E. Albright Scholarship is open to graduates of Garret County high schools who were born and reared in that county.

AGRICULTURAL DEVELOPMENT FOUNDATION—A number of awards are made to argicultural students from a fund contributed by donors for general agricultural development.

ALCOA FOUNDATION SCHOLARSHIPS AWARDS of $750 are given to outstanding students majoring in transportation, mechanical engineering, and fire protection engineering.

ALPHA PHI OMEGA (EPSILON MU CHAPTER) SCHOLARSHIP—This scholarship is awarded annually to a freshman student having a background in the Boy Scouts of America.

ALUMNI SCHOLARSHIPS—A limited number of scholarships are made possible through the gifts of alumni and friends to the Alumni Annual Giving Program of the Office of Endowment and Gifts.

ALUMNI ASSOCIATION OF MONTGOMERY COUNTY SCHOLARSHIPS—A limited number of scholarships are available to residents of Montgomery County.

ALUMNI ASSOCIATION OF THE SCHOOL OF PHARMACY SCHOLARSHIPS—The Alumni Association of the School of Pharmacy of the University of Maryland makes available annually scholarships to qualified prepharmacy students on the basis of character, achievement and need. These scholarships are open only to residents of the State of Maryland. Each scholarship not exceeding $500 per academic year is applied to expenses at College Park.

ALUMNI BAND SCHOLARSHIP—A limited number of awards to freshmen are sponsored by the University of Maryland Band Alumni Organization. Recipients are recommended by the Music Department after a competitive audition held in the spring.

ETHEL R. ARTHUR MEMORIAL SCHOLARSHIP—This memorial scholarship fund has been established by Irving J. Cohen, M.D. At least one $250 award is made each year by the Scholarship Committee. A preference is given to students from Baltimore.

ALVIN L. AUBINOE STUDENT AID PROGRAM—Scholarship grants up to $500 per school year to students in engineering, preferably those studying for careers in civil engineering, architecture or light construction.

BALTIMORE PANHELLENIC ASSOCIATION SCHOLARSHIP—A scholarship is awarded annually by the Baltimore Panhellenic Association to a student entering the junior or senior class, who is an active member of a sorority, who is outstanding in leadership and scholarship and who needs financial assistance.

BALTIMORE SUNPAPERS SCHOLARSHIP IN JOURNALISM—The Board of Trustees of the A. S. Abell Foundation, Inc., contributes funds to provide one or more $500 scholarships to students majoring in editorial journalism.

BAYSHORE FOODS, INC. SCHOLARSHIP—A grant of $500 is made available annually by J. McKenny Willis and Son, Inc., Grain, Feed and Seed Company of Easton, Maryland, to an outstanding student in vocational agriculture in Talbot County who will matriculate in the College of Agriculture.

BLACK AND DECKER MANUFACTURING COMPANY SCHOLARSHIP—A scholarship of $500 per year is provided for a Maryland resident who promises to teach Industrial Arts or Vocational-Industrial Education in Maryland for two years after graduation.

CAMPUS AND NEWCOMERS SCHOLARSHIP—Awards are made from a fund created by the campus and Newcomers Club of the University.

GEORGE C. COOK SCHOLARSHIP—A full scholarship is made available by the Maryland Educational Foundation in memory of the late George C. Cook. Preference shall be given to students interested in a career in business administration or marketing.

DR. ERNEST N. CORY SCHOLARSHIP—This memorial award is made annually to an outstanding junior or senior recommended by the College of Agriculture, preferably one majoring in entomology.

DAIRY TECHNOLOGY SCHOLARSHIP AND GRANTS—The Dairy Technology Society of Maryland and the District of Columbia provides a limited number of scholarships and grants-in-aid for students majoring in dairy products technology.

DELAWARE-MARYLAND PLANT FOOD ASSOCIATION SCHOLARSHIP—A $200 annual award is made to an undergraduate who has an interest in agronomy and soil fertility work.

DELMARVA TRAFFIC CLUB SCHOLARSHIP—An annual award of $250 is made to a transportation student from the Delmarva Peninsula.

EXEL SCHOLARSHIP—A substantial grant for endowed scholarships was made by Deborah B. Exel.

FMC CORPORATION SCHOLARSHIP—An annual award of $500 is made available for a senior in chemical engineering.

ANNE ARUNDEL COUNTY VOLUNTEER FIREMEN'S ASSOCIATION GRANT—This tuition and fees grant is awarded to a high school graduate who will enroll in the fire protection curriculum in the College of Engineering. The award is normally for four years.

BALTIMORE COUNTY VOLUNTEER FIREMAN'S ASSOCIATION GRANT—This tuition and fees grant is awarded to a student who will enroll in the fire protection curriculum in the College of Engineering. The award is normally for four years.

LADIES AUXILIARY TO THE MARYLAND STATE FIREMEN'S ASSOCIATION GRANT—This $750 grant is awarded to an outstanding high school graduate who will enroll in the fire protection curriculum in the College of Engineering. The award is normally available for four years.

MARYLAND STATE FIREMEN'S ASSOCIATION GRANT—A tuition and fees scholarship is awarded annually to an outstanding high school student who enrolls in the fire protection curriculum of the College of Engineering. This scholarship is for four years.

PRINCE GEORGES COUNTY VOLUNTEER FIREMEN'S ASSOCIATION GRANT—An annual tuition and fees scholarship is awarded to an outstanding high school student who enrolls in the fire protection curriculum of the College of Engineering.

FOOD FAIR STORES FOUNDATION SCHOLARSHIPS—Several scholarships are available for $250 per academic year.

FREDERICK COUNTY HOLSTEIN ASSOCIATION SCHOLARSHIP—A scholarship of $200 is awarded annually to a resident of Frederick County enrolled in the College of Agriculture.

VICTOR FRENKIL SCHOLARSHIP—A scholarship of $250 is granted annually by Mr. Victor Frenkil of Baltimore to a student from Baltimore City in the freshman class of the University.

GAMMA PHI BETA ALUMNI SCHOLARSHIP—Two annual scholarships are available to teachers employed in the teaching field. The awards pay tuition costs of graduate course designed for training teachers of gifted children.

GENERAL MOTORS SCHOLARSHIP—This scholarship is granted annually to an outstanding individual entering the freshman year.

THE JOHN D. GILMORE SCHOLARSHIP has been established for the purpose of assisting deserving student athletes to obtain an education and participate in varsity athletics at the University of Maryland. The recipients should possess, as does John D. Gilmore, outstanding dedication, determination and an undeniable will to win in athletic competition and to succeed in life.

GODDARD MEMORIAL SCHOLARSHIP—Several scholarships are available annually under the terms of the James and Sarah E. R. Goddard Memorial Fund established through the wills of Morgan E. Goddard and Mary Y. Goddard.

ROSE L. GRANT SCHOLARSHIP—At least $500 each year is made available to be awarded by the Scholarship Committee.

JOHN WILLIAM GUCKEYSON MEMORIAL SCHOLARSHIP—A scholarship of $100 is granted annually by Mrs. Hudson Dunlap as a memorial to John William Guckeyson, an honored Maryland and alumnus.

GUDELSKY MEMORIAL SCHOLARSHIP—The Gudelsky Foundation, Inc., has established a scholarship in memory of Harry Gudelsky and Isadore M. Gudelsky.

THE STALEY AND EUGENE HAHN MEMORIAL SCHOLARSHIP FUND—Annual awards of $500 are made by Mr. and Mrs. Walter J. Hahn in memory of their sons to aid outstanding agricultural students from Frederick County.

JAMES HARTIN ENGINEERING SCHOLARSHIP AND DONALD PETER SHAW MEMORIAL SCHOLARSHIP—These two scholarships of $300 each are made available annually by Mr. and Mrs. David C. Hartin. The first is awarded to a male student in the College of Engineering and the second to a male student in any college other than Education, or to a female student in nursing. These awards will be made to worthy students who are helping to earn their own college expenses.

HASKINS AND SELLS FOUNDATION, INC. AWARD—A scholarship of $500 is provided for an exceptional senior student majoring in accounting in the College of Business and Public Administration.

WILLIAM RANDOLPH HEARST FOUNDATION SCHOLARSHIPS—These scholarships are made available through a gift of the Baltimore News American, one of the Hearst newspapers, in honor of William Randolph Hearst. Scholarships

up to $1,000 are awarded annually to undergraduates pursuing a program of study in journalism. Scholarships up to $1,000 are awarded annually for graduate study in history

ROBERT MICHAEL HIGGINBOTHAM MEMORIAL AWARD FUND—This Fund has been endowed by Mr. and Mrs. Charles A. Higginbotham in memory of their son who was killed in Vietnam. Annual awards are made to promising junior students majoring in mathematics.

THE A. M. HOFFMAN MEMORIAL GRANT—This gift of $250 per year is normally awarded as a supplement to some other type of student aid to a student with exceptional need. A preference is given to students from Montgomery County. The gift is made available by Mr. and Mrs. David B. Schwartz.

HYATTSVILLE HORTICULTURAL SOCIETY SCHOLARSHIP—A scholarship of $200 is awarded to a student enrolled in Horticulture.

INTERFARTERNITY COUNCIL SCHOLARSHIP—Two awards of $250 each are available to members active in fraternity and interfraternity affairs. Recipients are selected by the Office of Student Aid upon recommendations from the presidents of their respective houses and the President of the IFC.

THE INTER-STATE MILK PRODUCERS' COOPERATIVE, INC. SCHOLARSHIP—A scholarship of $300 is made available to a student in agriculture in honor of Raymond Marvel, past-president of the cooperative.

IOTA LAMBDA SIGMA (NU CHAPTER) SCHOLARSHIP—This $200 scholarship is awarded annually to a male student in the industrial education curriculum. The student must be a resident of the State of Maryland and signify his intention of teaching in Maryland.

KAPPA KAPPA GAMMA NURSING SCHOLARSHIP—This $100 Scholarship is made available annually by the Gamma Psi chapter of the Kappa Kappa Gamma Sorority to a worthy student preparing for a career in nursing.

PAUL H. KEA MEMORIAL SCHOLARSHIP FUND—This fund was established by the Potomac Valley Chapter of the American Institute of Architects in memory of Paul H. Kea, a highly respected member of the chapter.

VENIA M. KELLER GRANT—The Maryland State Council of Homemakers' Club makes available this grant of $100 which is open to a Maryland young man or woman of promise who is recommended by the College of Home Economics.

KELLY-SPRINGFIELD TIRE COMPANY GRANT—Annual awards totaling $4200 are made to engineering students upon the recommendation of the College of Engineering. This gift is made available by The Kelly-Springfield Tire Company, Cumberland, Maryland, a subsidiary of The Goodyear Tire and Rubber Company of Akron, Ohio.

KIWANIS SCHOLARSHIP—The J. S. Ray Memorial Scholarship covering tuition is awarded by the Prince Georges Kiwanis Club to a male resident of Prince Georges County Maryland, who, in addition to possessing the necessary qualifications for maintaining a satisfactory scholarship record must have a reputation of high character and attainment in general all-around citizenship.

KIWANIS CLUB OF LAUREL SCHOLARSHIP—An annual award of $400 is made available to be awarded by the Scholarship Committee to needy students, preferably from the Laurel area.

LAUREL RACE COURSE, INC. SCHOLARSHIP—This fund has been established to provide scholarships for students who are participating in the University Band.

SAMUEL J. LEFRAK SCHOLARSHIP—A scholarship in honor of Geary F. Eppley, Dean of Men Emeritus, has been established by an alumnus, Mr. Samuel J. Lefrak, President of the Lefrak Organization, Forest Hills, New York. The award of $1,000 is made to a deserving sophomore who excels in both athletics and scholarship, to be used during his last two years at the University.

LEIDY CHEMICAL FOUDATION SCHOLARSHIP—A scholarship of $500 is granted annually to a graduate or undergraduate student preparing for a career in the general field of chemistry.

CHRISTIAN R. AND MARY F. LINDBACK FOUNDATION SCHOLARSHIP—The Trustees of the Christian R. and Mary F. Lindback Foundation provide an annual gift to the University, one-half of which is given for scholarships in agriculture and one-half for awards to the faculty for distinguished teaching.

HELEN ALETTA LINTHICUM SCHOLARSHIP—These scholarships, several in number, were established through the benefaction of the late Mrs. Aletta Linchicum, widow of the late Congressman Charles J. Linthicum, who served in Congress from the Fourth District of Maryland for many years.

LIONS INTERNATIONAL SCHOLARSHIP—An award of $500 is available to a freshman who competes in the Lions Club. (District 22-C) Annual Band Festival. A recipient is recommended by the Music Department after a competitive audition in the spring.

LOUGHBOROUGH LIONS CLUB SCHOLARSHIP—A scholarship providing tuition and fees is awarded to a graduate of Bethesda-Chevy Chase, Walt Whitman or Walter Johnson High Schools. The recipient is selected by the University on the basis of character and financial need.

THE M CLUB GRANTS—The M Club of the University of Maryland provides each year a limited number of awards.

MARYLAND EDUCATIONAL FOUNDATION GRANTS—This fund has been established to provide assistance to worthy students.

MARYLAND AND VIRGINIA MILK PRODUCERS ASSOCIATION SCHOLARSHIP—A scholarship of $500 is awarded annually in the College of Agriculture, preferably to a student preparing for a career in the dairy industry.

MARYLAND PHARMACEUTICAL ASSOCIATION SCHOLARSHIP—The Maryland Pharmaceutical Association makes available annually scholarships to prepharmacy students on the basis of character, achievement and need. Each scholarship not exceeding $500 per academic year is used in partial defrayment of fees and expenses at College Park. These scholarships are open only to residents of the State of Maryland.

MARYLAND STATE GOLF ASSOCIATION SCHOLARSHIPS—A limited number of $500 scholarships are available to undergraduates in the Agronomy Department who have an interest in golf turf work.

MORTAR BOARD SCHOLARSHIP—The Mortar Board Scholarship is awarded annually to a woman student on the basis of scholastic attainment and need.

MARYLAND TURFGRASS ASSOCIATION SCHOLARSHIP—A $250 annual award is made to an undergraduate who has an interest in agronomy and commercial sod production.

LOREN L. MURRAY AND ASSOCIATES SCHOLARSHIPS—This fund has been created to provide scholarships for Maryland residents who are admitted to the College of Education.

DR. RAY A. MURRAY SCHOLARSHIP—This award, sponsored by Maryland Chapter No. 32 of the National Institute of Farm and Land Brokers, is to be made to a worthy sophomore in the Department of Agricultural and Resource Economics, College of Agriculture.

NOPCO SCHOLARSHIP—Two scholarships at $250 each are provided for students in the College of Agriculture by the Nopco Chemical Company.

OLNEY ROTARY CLUB SCHOLARSHIP PROGRAM—Scholarship awards are made available annually for deserving students who are graduates of the high schools in the areas served by the Olney Rotary Club of Olney, Maryland.

PENINSULA HORTICULTURAL SOCIETY SCHOLARSHIP—The Peninsula Horticultural Society provides annually a $200 scholarship to the most deserving junior or senior student, a resident of Maryland from the Eastern Shore counties, who is majoring in horticulture or related subjects.

PHI ETA SIGMA SCHOLARSHIP—A limited number of $100 scholarships are available to young men entering the

sophomore class and who have achieved an academic average of 3.5 or higher during the freshman year.

DOUGLAS HOWARD PHILLIPS MEMORIAL SCHOLARSHIP—This scholarship fund has been endowed by Mr. and Mrs. Albanus Phillips, Jr. in honor of their son who met his untimely death in the spring before he was scheduled to attend the University, in order that worthy young male graduates of Cambridge, Maryland High School may have the opportunity he missed.

PILOT FREIGHT CARRIERS, INC., AWARD—A $500 award is made to a senior student in the College of Business and Public Administration who has majored in transportation.

POLICE RECORDER MAGAZINE SCHOLARSHIP—This fund has been established by the Police Recorder to provide scholarships to children of Maryland law enforcement officers. Recipients will be chosen in accordance with the usual standards of the Office of Student Aid.

WILLIAM H. PRICE SCHOLARSHIP—This award is made annually to a worthy student who is already working to defray part of his college expenses.

THE PRESSER FOUNDATION SCHOLARSHIP—Awards are made to undergraduate students who are pursuing their studies with the intention of becoming music teachers.

PURCHASING MANAGEMENT ASSOCIATION OF BALTIMORE, INC., SCHOLARSHIP—An annual award of $500 is given annually to a junior or senior student in the College of Business and Public Administration preparing for a career in business administration or business management.

RALSTON PURINA SCHOLARSHIP—A scholarship of $500 is awarded annually to an incoming senior or junior of the College of Agriculture.

ENSIGN RICHARD TURNER REA MEMORIAL SCHOLARSHIP—This scholarship fund has been established by Captain and Mrs. Richard F. Rea in honor of their late son who gave his life while on active duty in the U.S. Coast Guard. Two scholarships up to $500 each are awarded annually to students in engineering.

READ'S DRUG STORES FOUNDATION SCHOLARSHIPS—The Read's Drug Stores Foundation contributes annually several scholarships to prepharmacy students on the basis of achievement, character and need. Each scholarship not exceeding $500 per academic year is applied to the fees and expenses at College Park. Recipients must be residents of the State of Maryland.

MARY ELIZABETH ROBY MEMORIAL SCHOLARSHIP—An endowed scholarship has been established by the University Park Republican Women's Club. Limited awards are made to women entering the junior or senior years who are studying in the field of political science. A preference is given to residents of Prince Georges County.

VIVIAN F. ROBY SCHOLARSHIPS—This endowed fund was established through a bequest to the University of Maryland by Evalyn S. Roby in memory of her husband, class of 1912, to provide undergraduate scholarships to needy boys from Baltimore City and Charles County.

THE SCHLUDERBERG FOUNDATION SCHOLARSHIP GRANT—This Grant of $500 is awarded in the College of Agriculture to a student enrolled in the animal science or food science curriculum.

DR. FERN DUEY SCHNEIDER GRANT—A $100 grant is available to a foreign woman student enrolled in the College of Education, who has completed at least one semester in residence at the University. Funds for the grant are contributed by the Montgomery and Prince Georges County Chapters of the Delta Kappa Gamma Society.

F. DOUGLASS SEARS INSURANCE SCHOLARSHIP—Scholarships for Maryland students preparing for careers in the insurance industry are made available annually from a fund established by friends and associates of former State Insurance Commissioner F. Douglas Sears.

SEARS ROEBUCK FOUNDATION SCHOLARSHIPS—A limited number of grants from the Sears Roebuck Foundation are available for students in the College of Home Economics.

SOUTHERN STATES COOPERATIVE SCHOLARSHIPS—Two scholarships are awarded each year to sons of Southern States members—one for outstanding work in 4-H Club and the other for outstanding work in FFA. The amount of each scholarship is $300 per year and will continue for four years.

ADELE H. STAMP SCHOLARSHIP—This scholarship of $250 is awarded annually to a sophomore who is an active sorority member or pledge, who is outstanding in leadership and scholarship and who needs financial assistance. Funds for this scholarship are provided by the University of Maryland Panhellenic Association.

THE LEANDER F. STUART MEMORIAL SCHOLARSHIP—This scholarship of $300 is awarded annually to a student enrolled in the College of Agriculture.

JANE G. S. TALIAFERRO SCHOLARSHIP—Under the terms of the will of the late Jane G. S. Taliaferro a bequest has been made to the University of Maryland to provide scholarship aid to worthy students.

TAU BETA PI SCHOLARSHIP FUND—A limited number of scholarships are made available each year to worthy engineering students by members and alumni of Maryland Beta Chapter of Tau Beta Pi Association, Inc., national engineering honor society.

UNIVERSITY WOMEN'S CLUB, INC. MEMORIAL SCHOLARSHIP FUND—A scholarship of $150 is awarded each year to a junior or senior woman student on the basis of academic record, financial need and qualities of leadership and character. The funds are contributed by the Memorial Fund Committee of the University Women's Club of Washington, D.C.

JOSEPH M. VIAL MEMORIAL SCHOLARSHIP IN AGRICULTURE—Scholarships totaling $600 per year are made available by Mr. and Mrs. A. H. Seidenspinner to be awarded upon the recommendation of the College of Agriculture.

WESTERN ELECTRIC SCHOLARSHIP—Two scholarships are awarded to students in the College of Engineering. The amount of the scholarship covers cost of tuition, books and fees not to exceed $800 nor to be less than $400.

WESTINGHOUSE AIR ARM DIVISION SCHOLARSHIP—The Westinghouse Electric Corporation has established a scholarship to encourage outstanding students of engineering and the physical sciences. The scholarship is awarded to a sophomore student and is over a period of three years in six installments of $250. Students in electrical or mechanical engineering, engineering physics or applied mathematics are eligible for the award.

WOMEN'S ADVERTISING CLUB OF BALTIMORE WORK/EXPERIENCE SCHOLARSHIP—This award is available to an outstanding sophomore or junior interested in an advertising career.

WOMEN'S ARCHITECTURAL LEAGUE SCHOLARSHIP—This fund has been established to aid worthy students in the School of Architecture.

WOMEN'S AUXILIARY TO THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS SCHOLARSHIP—An annual $300 award is made to a senior in electrical engineering by the Baltimore section of the organization.

WOMEN'S CLUB OF BETHESDA SCHOLARSHIP—Several scholarships are available to young women residents of Montgomery County. Recipients must be accepted in the College of Education or the College of Nursing.

NICHOLAS BRICE WORTHINGTON SCHOLARSHIP—A $500 memorial scholarship is made available to a student in the College of Agriculture by the descendants of Nicholas Brice Worthington, one of the founders of the Agricultural College.

THE ARTHUR YOUNG AND CO. FOUNDATION, INC. SCHOLARSHIP—The Arthur Young and Co. Foundation, Inc., makes available a scholarship of $750 for an exceptional senior student concentrating in accounting.

STUDENT LOANS

NDEA STUDENT LOANS—Loan funds are available under provision of the National Defense Education Act. The borrower must sign a note for the loan and agree to interest and repayment terms established by the University. Repayment of the loan begins nine months after the borrower ceases to be a full-time student and must be completed within ten years thereafter No interest is charged on the loan until the beginning of the repayment schedule. Interest after that date is to be paid at three percent per annum.

If the borrower becomes a full-time teacher (elementary, secondary or college), ten percent of the loan can be cancelled for each year of teaching, not to exceed 50 prcent of the loan. However, if the teaching involves handicapped students or is in a predominantly low income area school, fifteen percent annual cancellation is allowed to the full amount of the loan.

CATHERINE MOORE BRINKLEY LOAN FUND—Under the will of Catherine Moore Brinkley, a loan fund is available for worthy students who are natives and residents of Maryland.

KEA STUDENT LOAN FUND—A loan fund has been established by gifts from Mr. and Mrs. Paul H. Kea. The purpose of the fund is to make non-interest bearing loans of an emergency nature to students who are helping to earn the expenses of their eduation.

JOSEPH W. KINGHORN AND MORLEY A. JULL FUNDS—Memorial trust funds have been established in honor of Joseph W. Kinghorn, first graduate of the University of Maryland Poultry Department. These funds are available as loans to students enrolled in the Poultry Department.

EDNA B. MC NAUGHTON MEMORIAL LOAN FUND—This fund has been established by Mrs. W. B. Clayton in memory of Edna B. McNaughton, who initiated and developed the program in Early Childhood Education at the University of Maryland. Priority is given to students enrolled in this program.

PHI DELTA GAMMA LOAN FUND—This fund has been established under essentially the same terms and conditions as the NDEA loans. Recipients must be recommended by the Sigma Chapter of the Phi Delta Gamma Sorority.

JAN STEVEN AND SIDNEY RAPKE MEMORIAL LOAN FUND—This fund has been established in memory of Jan Steven Rapke by his parents. Short-term, interest free loans are available to students in good standing to meet personal emergencies as they arise. It is the wish of the donors that the fund be administered with a minimum of formality.

UNITED STUDENT AID FUNDS—Loans up to $1,000 per year are available from many banks to students at the University. Maximum interest on such loans is 7 per cent simple. Monthly installments are usually not less than $25 nor more than $100. Repayment begins ten months after the student ceases to be a full-time student.

SIEGFRIED E. WEISBERGER, JR. MEMORIAL FUND—A memorial trust fund has been established in honor of Siegfried Weisberger, Jr., a Freshman student in Agriculture in 1958-59. Under terms of this loan, students in Agriculture may borrow money without interest for short term needs.

PART-TIME EMPLOYMENT

UNIVERSITY EMPLOYMENT—The University offers dining hall and dormitory workships permitting selected Maryland residents to earn part or all of their board and room. Other jobs on campus pay hourly rates according to the skill and education required.

OFF-CAMPUS EMPLOYMENT—A file of off-campus part-time jobs is maintained. Most of these are with local stores and business firms.

COLLEGE WORK-STUDY PROGRAM—Part-time employment during the school year plus full-time employment during the summer may be combined with scholarships and loans to provide educational opportunities to qualified students.

TICKETS ON SALE

THE COLLEGES AND SCHOOLS

This section of the catalog provides information for undergraduates concerning the University of Maryland's schools and colleges. Included in this section are the individual college requirements and policies for particular programs of study. Each college has a general statement of purpose or role within the University, the organizational structure of the college, the undergraduate programs including specific requirements for admission and graduation in addition to the all-University requirements listed in the General Information Section of the catalog, a description of degree programs, and course descriptions.

Courses numbered from 000 to 099 are noncredit courses and include such subjects as required physical education and review of high school math.

Courses numbered from 100 to 199 are primarily freshmen courses and are open to undergraduate students who meet the stated prerequisite and curricular requirements.

Courses numbered from 200-299 are primarily sophomore courses and are open to undergraduate students who meet the stated prerequisite and curricular requirements.

Courses numbered from 300-399 are junior and senior courses not acceptable for credit toward graduate degrees. Under some conditions, second semester sophomores may register for 300 level courses with the dean's approval.

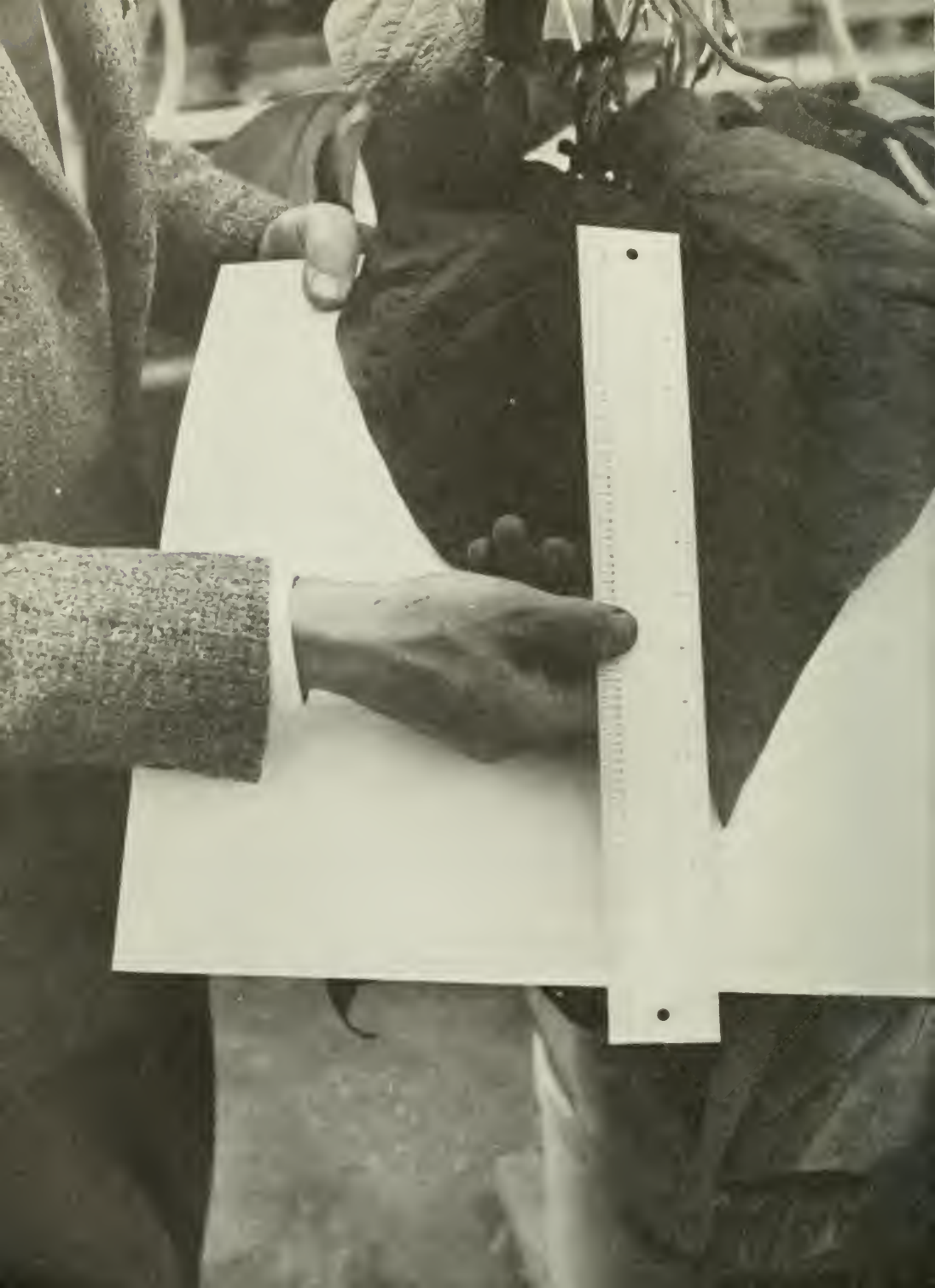
Courses numbered from 400-499 are junior and senior courses acceptable for credit toward some graduate degrees.

Courses numbered from 500-599 are professional school courses and post-baccalaureate courses.

Courses numbered from 600-899 are restricted to graduate students.

Course numbers ending with an 8 or 9 indicate the course may be repeated for credit.

For your assistance in using this publication, the old course number will be written in parentheses immediately following the new number.



Agriculture

THE COLLEGE OF AGRICULTURE offers educational programs with a broad cultural and scientific base. Students are prepared for careers in agricultural related sciences, technology and business.

The application of advanced knowledge to the solution of some of man's most critical problems concerning adequate amounts and quality of food, and the quality of environment in which he lives, are important missions of the College.

This original College of the University of Maryland at College Park was chartered in 1856. The College of Agriculture has a continuous record of leadership in education since that date. It became the beneficiary of the Land-Grant Act of 1862. Since that time, there has been a merger with the University of Maryland in Baltimore and continuous growth with additions of other colleges and departments at College Park.

The College of Agriculture continues to grow and develop as part of the greater University, providing education and research activities enabling man to use his environment and natural resources to best advantage while conserving basic resources for future generations.

ADVANTAGES OF LOCATION AND FACILITIES

Educational opportunities in the College of Agriculture are enhanced by the nearby location of several research units of the federal government. Of particular interest is the Agricultural Research Center at Beltsville and the U. S. Department of Agriculture Headquarters in Washington, D. C. The National Agricultural Library is an important resource for information at the Beltsville location.

Related research laboratories of the National Institutes of Health, military hospitals, NASA, and the National Bureau of Standards are in the vicinity. Interaction of our faculty and students with personnel from these agencies is encouraged. Teaching and research activities are conducted with the cooperation of scientists and professional people in government positions.

Instruction in the basic sciences, and in social, economic and engineering principles is carried out in well-designed classrooms and laboratories on the campus. The application of basic principles to practical situations is demonstrated for the student in numerous ways. New buildings have been provided for both the plant and animal sciences in recent years.

Modern greenhouses are available for breeding and propagation of a wide variety of plant work on the control of weeds and improved cultural practices.

Herds of dairy and beef cattle, swine and flocks of poultry and sheep are kept on the campus for teaching and research purposes.

Several operating farms, located in central Maryland and on the Eastern Shore, support the educational programs in Agriculture by providing locations where important crops, animals and poultry can be grown and maintained under prac-

tical and research conditions. These farms add an important dimension to the courses offered in Agriculture. Data from these operations and from cooperating producers and processors of agricultural products are utilized by students interested in economics, teaching, engineering, and conservation, as they relate to Agriculture, as well as by those concerned with biology or management of agricultural crops and animals.

GENERAL INFORMATION

The College of Agriculture offers programs leading to a wide variety of rewarding careers. These curricula prepare the student for useful, informed citizenship, with a basic understanding of science in general, and with a concentration on the science and business of agriculture in particular. All four-year programs lead to the Bachelor of Science degree.

Today's agriculture is a highly complex and extremely efficient industry which includes supplies and services used in agricultural production, the production process itself, and the marketing, processing and distribution of products to meet the consumers' needs and wants.

Instruction in the College of Agriculture includes the fundamental sciences and emphasizes the precise course information that its graduates must employ in the industrialized agriculture of today, and helps develop the foundation for their role in the future. Course programs in specialized areas may be tailored to fit the particular needs of the individual student.

Previous training in agriculture is not a prerequisite for matriculation. Careers for men and women with rural, suburban or urban backgrounds are available in agriculture and its allied industries.

Graduates of the College of Agriculture have a broad base for careers and continued learning after college in business, production, teaching, research, extension, and many other professional fields.

REQUIREMENTS FOR ADMISSION

The requirements for admission to the College of Agriculture are the same as those of the University.

For students entering the College of Agriculture it is recommended that their high school preparatory courses should include English, 4 units; mathematics, 3 units; biological and physical sciences, 3 units; and history or social sciences, 2 units. Four units of mathematics should be elected for students entering agricultural engineering or agricultural chemistry.

JUNIOR STANDING

To earn junior standing a student must complete 56 credit hours of academic work and attain the required grade point average.

REQUIREMENTS FOR GRADUATION

Each student must complete at least 120 credit hours in academic subjects with a minimum grade point average of 2.0 (C). University requirements in health and physical education must be satisfied, in addition.

HONORS PROGRAM

The Honors Program is approved for majors in agricultural economics and botany. The objective of the Honors Program is to recognize superior scholarship and to provide opportunity for the excellent student to broaden his perspective and to increase the depth of his studies.

The programs in Honors are administered by Departmental Honors Committees and supervised by the College Committee on Honors. Students in the College of Agriculture, who are in the top 20 percent of their class at the end of their first year may be considered for admission into the Honors Program. Of this group up to 50 percent may be admitted.

Sophomores or first semester juniors will be considered upon application from those students in the upper 20 percent of their class. While application may be made until the student enters his sixth semester, early entrance into the program is recommended. Students admitted to the program enjoy certain academic privileges.

On the basis of the student's performance during his participation in the Honors Program, the department may recommend the candidate for the appropriate degree with (departmental) honors, or for the appropriate degree with (departmental) high honors. Successful completion of the honors program will be recognized by a citation in the Commencement Program and by an appropriate entry on the student's record and diploma.

FACULTY ADVISEMENT

Each student in the College of Agriculture is assigned to a faculty advisor. Advisors normally work with a limited number of students and are able to give individual guidance. The faculty will assist students in obtaining employment providing practical or technical experience for those in need of such experience.

FRESHMAN YEAR

The program of the freshman year is similar for all curricula of the College of Agriculture. During the first year the student obtains a broad foundation in subjects basic to agriculture and the related sciences. Transfer from one curriculum to another, or from the College of Agriculture to another college of the University may be made by the end of the freshman year usually with little or no loss of credit.

Students entering the freshman year with a definite choice of curriculum are assigned to de-

partmental advisors for counsel and planning of all academic program. Students entering the freshman year, who have not selected a definite curriculum, are assigned to a general advisor who assists with the choice of freshman electives and, during the course of the year, acquaints students with opportunities in the curricula in the College of Agriculture and in other divisions of the University. If by the close of the freshman year a student makes no definite choice of a specialized curriculum, he continues under the guidance of his advisor in the General Agriculture curriculum.

SCHOLARSHIPS

A number of scholarships are available for agricultural students. These include awards granted by the Agricultural Development Fund, Bayshore Foods, Inc., Dairy Technology Society of Maryland and the District of Columbia, Delaware-Maryland Plant Food Association, Inc., Dr. Ernest N. Cory Trust Fund, Danforth Foundation, Frederick County Holstein Association Scholarship, General Foods Fund Scholarship, Hyattsville Horticultural Society Scholarship, The Leander F. Stuart Memorial Scholarship, Inter-State Milk Producers, Joseph M. Vial Memorial Scholarship Program in Agriculture, Maryland Cooperative Milk Producers, Inc., Maryland Turfgrass Association, Maryland State Golf Association, Maryland and Virginia Milk Producers, Inc., Dr. Ray A. Murray Scholarship, Peninsula Horticultural Society, Ralston Purina Company, The Schluderberg Foundation Scholarship, Southern States Cooperative, Inc., and The Staley and Eugene Hahn Memorial Scholarship Fund.

These scholarships are awarded by the Faculty Committee in accordance with the terms of the respective grants. For more detailed information about these awards, see section on financial aid.

STUDENT ORGANIZATIONS

Students find opportunity for varied expression and growth in the several voluntary organizations sponsored by the College of Agriculture. These organizations are: Agricultural Economics Club, Block and Bridle, Dairy Science Club, Collegiate 4-H Club, Future Farmers of America, Agronomy Club, and the Veterinary Science Club.

Alpha Zeta is a national agricultural honor fraternity. Members are chosen from students in the College of Agriculture who have attained the scholastic requirements and displayed leadership in agriculture.

The Agricultural Student Council is made up of representatives from the various student organizations in the College of Agriculture. Its purpose is to coordinate activities of these organizations and to promote work which is beneficial to the college.

REQUIRED COURSES

All students in the College of Agriculture are required to complete a series of courses to satisfy the University General Education requirements, college requirements and departmental requirements. The courses needed to complete a program of study are selected by the student with the approval of his advisor.

University Requirements	Semester Credit Hours
ENGL 101 or 171—Composition of Honors Composition.	3
ENGL Literature	6
Social Science	6
History	6
Mathematics	3
Fine Arts or Philosophy	3
HLTH 105—Science and Theory of Health	2
Physicial Education	2

COLLEGE OF AGRICULTURE REQUIREMENTS

Courses selected from the basic life sciences, physical sciences and mathematics	16
SPCH 107—Public Speaking	2
AGRI 101—Introduction to Agriculture	1
Department Requirements	74

TYPICAL FRESHMAN YEAR IN AGRICULTURE

	Semester I	Semester II
ENGL 101 or 171—Composition or Honors Composition	3	.
Social Science	3	3
AGRI 101—Introduction to Agriculture	1	.
BOTN 100—General Botany	4	.
ZOOL 101—General Zoology	.	4
ANSC 101—Principles of Animal Science	3	.
AGRO 100—Crop Laboratory	.	2
Mathematics	.	3
Health	2	.
Arts or Philosophy	.	3
Physical Education	1	1

AGRICULTURE—GENERAL

The General Agriculture curriculum provides for the development of a broad understanding in agriculture.

The flexibility of this curriculum permits selection of electives that will meet individual vocational plans in agriculture and agriculturally related business and industry.

The College of Agriculture science requirement will be satisfied by completing the following courses:

BOTN 100—General Botany	4
CHEM 103,104—College Chemistry I, II	4,4
ZOOL 101—General Zoology	4

General Agriculture Requirements	Semester Credit Hours
AGEN 100—Introduction to Agricultural Engineering	4
AGEN 200—Introduction to Farm Mechanics	2
AGRO 100—Crop Production Laboratory	2
AGRO 202—General Soils	4
AGRO 407—Cereal Crop Production	2
AGRO 406—Forage Crop Production	2
AGRO 451—Cropping Systems	2
ANSC 101—Principles of Animal Science	3
ANSC 203—Feeds and Feeding	3
ANSC 242—Dairy Production	3
ANSC 262—Commercial Poultry Management	3
AREC 250—Elements of Agricultural Economics	3
AREC 251—Marketing of Agricultural Products	3
BOTN 221—Diseases of Plants	4
ENTM 252—Insect Pests of Agricultural Crops	4

HORT 111—Tree Fruit Production	3
or	
HORT 222—Vegetable Products	3
RLED 464—Rural Life in a Modern Society	3
Elect either of the following pairs of courses:	
BOTN 414—General Plant Genetics and	
MICB 200—General Microbiology	2,4
or	
BSAD 220, 221—Principles of Accounting	3,3
Electives	18

AGRICULTURAL CHEMISTRY

This curriculum insures adequate instruction in the fundamentals of both the physical and biological sciences. It may be adjusted through the selection of electives to fit the student for work in agricultural experiment stations, soil bureaus, geological surveys, food laboratories, fertilizer industries, and those handling food products.

The College of Agriculture science requirement will be satisfied by completing 16 credit hours from the following courses:

	Semester Credit Hours
BOTN 100—General Botany	4
MICB 200—General Microbiology	4
ZOOL 101—General Zoology	4
and	
CHEM 103,104—College Chemistry I, II	4,4

REQUIRED OF ALL STUDENTS:

CHEM 203—College Chemistry IV	3
CHEM 204—College Chemistry IV Laboratory	2
CHEM 201—College Chemistry III	3
CHEM 202—College Chemistry III Laboratory	2
CHEM 421—Advanced Quantitative Analysis or	3
CHEM 321—Intermediate Quantitative Analysis	4
AGRO 202—General Soils	4
GEOL 100—Geology	3
MATH 141—Analysis II	4
Modern Languages	*12
PHYS 161—General Physics	3
PHYS 262—General Physics	4
PHYS 263—General Physics	4
Electives in Biology	6
Electives in Agricultural Chemistry	6

*See Foreign Language Requirement of College of Arts & Sciences.

AGRICULTURAL ENGINEERING

Agricultural engineering utilizes both the physical and biological sciences to help meet the needs of our increasing world population for food, natural fiber and improvement or maintenance of the environment. Scientific and engineering principles are applied to the conservation and utilization of soil and water resources for food production and recreation; to the utilization of energy to improve labor efficiency and to reduce laborious and menial tasks; to the design of structures and equipment for housing or handling of plants and animals to optimize growth potential; to the design of residences to improve the standard of living for the rural population; to the development of methods and equipment to maintain or increase the quality of food and natural fiber; to the flow of supplies and equipment to the agricultural and aquacultural production units; and to the flow of products from the production units and the processing plants to the consumer. The agricultural engineer places emhasis on maintaining a high quality environment as he works toward developing efficient and economical engineering solutions.

The undergraduate curriculum provides opportunity to prepare for many interesting and challenging careers in design, management, research, education, sales, consulting, or international service. The program of study includes a broad base of mathematical, physical and engineering sciences combined with basic biological sciences. Twenty hours of electives give flexibility so that a student may plan a program according to his major interest.

The College of Agriculture science requirement will be satisfied by completing the following:

	Semester Credit Hours
CHEM 103,104—College Chemistry I, II	4,4
PHYS 161,262,263—General Physics	3,4,4

DEPARTMENTAL REQUIREMENTS

AGEN 324—Engineering Dynamics of Biological Materials	3
AGEN 424—Functional and Environmental Design of Agricultural Structures	3
AGEN 343—Functional Design of Machinery and Equipment	3
AGEN 421—Power Systems	3
AGEN 422—Soil and Water Engineering	3
ENCE 350,351—Structural Analysis	3,3
ENES 101—Intro Engineering Science	3
ENES 110—Mechanics	3
ENES 220—Mechanics of Materials	3
ENES 221—Dynamics	3
ENCE 200—Materials Science	3
ENME 216—Thermodynamics	3
ENME 340 or ENCE 330—Fluid Mechanics	3
ENEE 300—Prin. of Electrical Engineering	3
MATH 140,141—Analysis I, II	4,4
MATH 240—Linear Algebra	4
MATH 246—Differential	3
ZOOL 101—General Zoology	
or	
BOTN 100—General Botany	4
Electives*	20

*Fourteen credits, releted to field of concentretion, must be selected from a departmentelly epproved list. Eight credits must be 300 level end above.

AGRICULTURAL AND EXTENSION EDUCATION

This Department offers instruction in education and other applied behavioral sciences needed by persons preparing to teach agriculture, to enter extension work and to undertake other activity of an educational nature.

Two undergraduate curriculum options are available. The agricultural education curriculum is designed primarily for persons who wish to prepare for teaching agriculture in the secondary schools. The agricultural extension education curriculum is designed for those preparing to enter the Cooperative Extension Service. Either option may lead to a variety of other career opportunities in agricultural business and industry, public service, communications, research, and college teaching.

Students preparing to become teachers of agri-

culture—including horticulture, agribusiness or other agricultural related subjects—should have had appropriate experience with the kind of agriculture they plan to teach or should arrange to secure that experience during summers while in college.

Students in the agricultural education curriculum are expected to participate in the Collegiate Chapter of the Future Farmers of America in order to gain needed training to serve as advisors of high school chapters of the FFA upon graduation.

The College of Agriculture science requirement will be satisfied by completing 16 credit hours from the following courses:

	Semester Credit Hours
BOTN 100—General Botany	4
CHEM 103,104—College Chemistry I,II	4,4
MATH 105—Fundamentals of Math	4
ZOOL 101—General Zoology	4

DEPARTMENTAL REQUIREMENTS, BOTH OPTIONS

ANSC 101—Principles of Animal Science	3
ANSC 203—Feeds and Feeding	3
AGRO 102—Crop Production, or AGRO 406—Forage Crop Production	2
AGRO 202—General Soils	4
AGEN 100—Introduction to Agricultural Engineering	4
AREC 407—Financial Analysis of the Farm Business, or AREC 406—Farm Management	3
RLED 464—Rural Life in Modern Society	3
RLED 303—Teaching Materials and Demonstrations	2
ENTM 252—Insect Pests of Agricultural Crops	4
BOTN 221—Diseases of Plants	4
HORT 231—Greenhouse Management, or HORT 222—Vegetable Production, or HORT 271—Plant Propagation	3

AGRICULTURAL EDUCATION OPTION

RLED 313—Student Teaching	5
RLED 315—Student Teaching	1-4
RLED 302—Introduction to Agricultural Education	2
RLED 311—Teaching Secondary Vocational Agriculture	3
RLED 305—Teaching Young and Adult Farmer Groups	1
EDUC 300—Human Development and Learning	6
EDUC 301—Foundations of Education	3
AGEN 200—Introduction to Farm Mechanics	2
AGEN 305—Farm Mechanics	2
Approved Electives	15

AGRICULTURAL EXTENSION OPTION

RLED 422—Extension Education	2
RLED 423—Extension Communications	2
RLED 323—4-H Organization and Procedure	2
RLED 325—Directed Experience in Extension Education	1-5
PSYC 100—Introduction of Psychology	3
PSYC 221—Social Psychology	3
EDHD 160—Educational Psychology	3
AREC 452—Economics of Resource Development	3
Approved Electives	21

AGRICULTURAL AND RESOURCE ECONOMICS

The curriculum in Agricultural and Resource Economics combines training in the business, economics and international aspects of agricultural production and marketing with the biological and physical sciences basic to agriculture. Programs are available for students in Agricultural Economics, Agricultural Business, International Agriculture, and Resource Economics. Students desiring to enter agricultural marketing or business affiliated with agriculture may elect the Agricultural Business option; and those interested in foreign service may elect the International Agriculture option. Students primarily interested in the broad aspects of production and management as it is related to the operation of a farm business may elect the Agricultural Economics option. Those interested in training in the broad area of resource management and evaluation may elect the Resource Economics option.

In these programs, students are trained for employment in agricultural business firms; for positions in sales or management; for local, state, or federal agencies; for extension work; for high school and college teaching; for research, and for farm operation or management.

Courses for the freshman and sophomore years are essentially the same for all students. In the junior year the student selects the option of his choice. Courses in this department are designed to provide training in the application of economic principles to the production, processing, distribution, and merchandising of agricultural products and the effective management of our natural and human resources, as well as the inter-relationship of business and industry associated with agricultural products. The curriculum includes courses in general agricultural economics, marketing, farm management, prices, resource economics, agricultural policy, and international agricultural economics.

The College of Agriculture science requirement will be satisfied by completing 16 credit hours from the following courses:

	Semester Credit Hours
BOTN 100—General Botany	4
CHEM 103,104—College Chemistry I,II	4,4
MATH 220,221—Elementary Calculus	3,3
MICB 200—General Microbiology	4
PHYS 111—Elements of Physics	3
ZOOL 101—General Zoology	4

REQUIRED OF ALL STUDENTS

AREC 404—Prices of Agricultural Products	3
BSAD 220—Principles of Accounting	3
BSAD 230—Business Statistics I	3
or	
AGRI 301—Introduction to Agricultural Biometrics	3
ECON 201—Principles of Economics I	3
ECON 203—Principles of Economics II	3
ECON 401—National Income Analysis	3
ECON 403—Intermediate Price Theory	3
MATH 110—Introduction to Mathematics	3
MATH 111—Introduction to Mathematics	3
MATH 220—Elementary Calculus	3

A minimum of nine hours of technical agriculture must be selected in consultation with the student's advisor.

The student's total program must contain a minimum of 15 credit hours of courses in Agriculture and Resource Economics.

AGRIBUSINESS OPTION

Each student must take the following courses:

AREC 406—Farm Management	3
AREC 416—Marketing Management of Agribusiness Enterprises	3
AREC 427—Agricultural Commodity Markets: An Economic Analysis	3
AREC 432—Agricultural Policy and Programs	3

AGRICULTURAL ECONOMICS OPTION

Each student must take 12 hours as follows:

AREC 406—Farm Management	3
ECON 425—Mathematical Economics	3
or	
ENGL 291—Expository Writing	3
MATH 221—Elementatry Calculus	3
Statistics	3

INTERNATIONAL AGRICULTURE OPTION

Each student must take the following:

AREC 444—World Agricultural Production and Trade	3
AREC 445—Foreign Agricultural Economies	3
ECON 415—Introduction to Economic Development of Underdeveloped Areas	3
ECON 440—International Economics	3

RESOURCE ECONOMICS OPTION

Each student must take the following:

AREC 240—Environment in Human Ecology	3
AREC 452—Economics of Resource Development	3
ECON 450—Introduction to Public Finance	3

AGRONOMY

The Department of Agronomy offers instruction in crop science and soil science. A turf and urban agronomy option is offered under crop science and a conservation of soil, water and environment option is offered under soil science. These options appeal to students who are interested in urban problems or environmental science. The agronomy curricula are flexible and allow the student either to concentrate on basic science courses that are needed for graduate work or to select courses that prepare him for employment at the bachelor's degree level as specialists with park and planning commissions, road commissions, extension service, soil conservation service, and other governmental agencies. Many graduates with the bachelor's degree are also employed by private corporations such as golf courses and seed, fertilizer, chemical, and farm equipment companies.

Students completing graduate programs are prepared for college teaching and research, or research and management positions with industry and governmental agencies.

Additional information on opportunities in agronomy may be obtained by writing to the Department of Agronomy.

The College of Agriculture science requirement will be satisfied by completing:

	Semester Credit Hours
CHEM 103,104—College Chemistry I,II	4,4

and selecting eight semester credits hours from the following courses:

BOTN 100—General Botany	4
MICB 200—General Microbiology	4
ZOOL 101—General Zoology	4
or	
other courses selected from CHEM, MATH or PHYS.	

DEPARTMENTAL REQUIREMENTS (CROP SCIENCE)

	Semester Credit Hours
AGRO 100—Crops Laboratory	2
AGRO 202—General Soils	4
AGRO—Advanced Crops Courses	6
AGRO—Advanced Soils Courses	6
AGRO 398—Senior Seminar	1
BOTN 212—Plant Taxonomy	3
BOTN 221—Diseases of Plants	4
BOTN 441—Plant Physiology	4
Electives	15
Major electives approved by crops advisor	28

TURF AND URBAN AGRONOMY OPTION

A student following this option in the crop science curriculum must include the following courses among his major electives:

	Semester Credit Hours
AGRO 405—Turf Management	3
AGRO 415—Soil Survey and Land Use	3
HORT 160—Introduction to the Art of Landscaping	3
HORT 453—Woody Plant Materials	3
RECR 495—Planning, Design and Maintenance of Park and Recreational Areas and Facilities	3

DEPARTMENTAL REQUIREMENTS (SOIL SCIENCE)

	Semester Credit Hours
AGRO 100—Crops Laboratory	2
AGRO—Advanced Crops Courses	4
AGRO 202—General Soils	4
AGRO 414—Soil Classification and Geography	4
AGRO 417—Soil Physics	3
AGRO 421—Soil Chemistry	3
AGRO 398—Senior Seminar	1
GEOL 100—Introductory Physical Geology	3
GEOL 110—Physical Geology Laboratory	1
Major electives approved by soils advisor	34
Electives	15

CONSERVATION OF SOIL, WATER AND ENVIRONMENT OPTION

A student following this option in the soil science curriculum must include the following courses among his major electives:

	Semester Credit Hours
AGRO 412—Soil and Water Conservation	3
AGRO 423—Soil-Water Pollution	3
AGEN 432—General Hydrology	3
BOTN 211—Principles of Conservation	3
AGRO 415—Soil Survey and Land Use	3
AGRI 489—Air Pollution Biology	3
GEOG 445—Climatology	3

ANIMAL SCIENCE

The curriculum in animal science offers a broad background in general education, basic sciences, agricultural sciences, and the opportunity for a student to emphasize that phase of animal agriculture in which he is specifically interested. Each student will be assigned to an advisor according to the program he plans to pursue.

Objectives

In addition to fulfilling the requirements of the University and the College of Agriculture, the following specific objectives have been established for the program in animal science.

1. To acquaint students with the role of animal agriculture in our cultural heritage.
2. To prepare students for careers in the field of animal agriculture. These include positions of management and technology associated with animal, dairy, or poultry produc-

tion enterprises; positions with marketing and processing organizations; as well as in other allied fields such as feed, agricultural hemicals and equipment firms.

3. To prepare students for entrance to veterinary schools.
4. To prepare students for graduate study and subsequent careers in teaching, research and extension, both public and private.
5. To provide essential courses for the support of other academic programs of the University.

The College of Agriculture science requirement will be satisfied by completing:

	Semester Credit Hours
CHEM 103,104—College Chemistry I,II	4,4
and selecting eight semester credit hours from the following courses:	
BOTN 100—General Botany	4
MICB 200—General Microbiology	4
ZOOL 101—General Zoology	4

DEPARTMENTAL REQUIREMENTS

FDSC 111—Introduction to Food Science	3
ANSC 101—Principles of Animal Science	3
ANSC 201—Principles of Animal Genetics	3
ANSC 402—Fundamentals of Nutrition	3
ANSC 403—Applied Animal Physiology	4
ANSC 411—Anatomy of Domestic Animals	4
ANSC 412—Introduction to Diseases of Animals	3
Mathematics or Biometrics or both	6
Plus one course in each of the following disciplines:	
Agronomy	2-4
Agricultural Engineering	2-4
Entomology	2-4
Economics	2-4
Physics or Organic Chemistry	2-4
	55-65
Electives	28-38

For students interested in a program of study with major emphasis on beef cattle, sheep and swine, it is suggested that the elective courses include the following:

	Semester Credit Hours
ANSC 221—Fundamentals of Animal Production	3
ANSC 222—Livestock Evaluation	3
ANSC 223—Seminar	1
ANSC 301—Advanced Livestock Judging	2
ANSC 402—Applied Animal Nutrition	3
ANSC 422—Meats	3
ANSC 423,424—Livestock Management	6
ANSC 426—Principles of Breeding	3

For students interested in a program of study with major emphasis on dairying, it is suggested that the elective courses include the following:

ANSC 242—Dairy Production	3
ANSC 244—Dairy Cattle Type Appraisal	1
ANSC 442—Dairy Cattle Breeding	3
ANSC 446—Physiology of Mammalian Reproduction	3

For students interested in a program of study with a major emphasis on poultry, it is suggested that the elective courses include the following:

ANSC 261—Advanced Poultry Judging	1
ANSC 262—Commercial Poultry Management	3
ANSC 462—Physiology of Hatchability	1
ANSC 464—Poultry Hygiene	3
ANSC 466—Avion Anatomy	3
FDSC 461—Technology of Market Eggs and Poultry	3

Students desiring a combination of training in one of the animal sciences and emphasis on business may choose selective courses from the following:

BSAD 110—Business Enterprise	3
BSAD 220—Principles of Accounting	3
BSAD 230—Business Statistics	3
BSAD 380—Business Law	3
MATH 110—Introduction to Math	3
ECON 205—Fundamentals of Economics	3
ECON 430—Money and Banking	3
BSAD 350—Marketing Principles and Organization	3
AGRI 401—Agricultural Biometrics	3

BOTANY

The Department offers work in the major fields of physiology, pathology, ecology, taxonomy, anatomy-morphology, and genetics.

The required courses for the freshman and sophomore years are the same for all students. In the junior and senior years, the student elects botany courses to suit his particular interest. Courses are required in other subjects to contribute toward a broad cultural education, and to support the courses selected in the chosen field of botany.

The curriculum provides a complete survey of the field of botany, and lays a good foundation for graduate work in botany in preparation for teaching and for research in experiment stations or private research laboratories.

Students who wish to meet the requirements for certificates in secondary education may elect basic courses in education. An additional semester will usually be necessary to take certain courses in education, including the required practice teaching. As long as the demand continues, a series of advanced courses will be offered in rotation in the summer session especially for teachers working toward the degree of Master of Education in science teaching.

The Department of Botany has instituted an Honors Program which a student may enter if he desires and if he meets the requirements of the program.

The College of Agriculture science requirement will be satisfied by completing the following courses:

BOTN 100—General Botany	4
CHEM 103,104—College Chemistry I, II	4,4
ZOOL 101—General Zoology	4

DEPARTMENT OF BOTANY REQUIREMENTS

	Semester Credit Hours
BOTN 202—General Botany	4
BOTN 212—Plant Taxonomy	3
BOTN 221—Diseases of Plants	4
BOTN 441—Plant Physiology	4
BOTN 462—Plant Ecology	2
BOTN 464—Plant Ecology Laboratory	1
BOTN 411—Plant Anatomy	3
BOTN 414—General Plant Genetics	3
BOTN 398—Seminar	2
Modern Language, preferably German, to satisfy Arts & Science requirements	6-12
MATH 110,111—Introduction to Mathematics or Math 140,141	6
MICB 200—General Microbiology	4
PHYS 121,122—Fundamentals of Physics	8
Botany electives or related courses	10
Electives	12

CONSERVATION AND RESOURCE DEVELOPMENT

The development and use of natural resources (including water, soil, minerals, fresh water and marine organisms, wildlife, air and human resources), are essential to the full growth of an economy.

The curriculum in Conservation and Resource Development is designed to instill concepts of the efficient development and judicious management of natural resources. The study of the problems associated with use of natural resources will acquaint students with their role in economic development while maintaining concern for the quality of the environment.

Students will prepare for professional and administrative positions in land and water conservation projects, for careers in operational, administrative, educational, and research work in land use, fish and wildlife management, natural resource management, recreational area development, and management, or for graduate study in any of the several areas within the biological sciences.

Students will pursue a broad education program and then elect subjects concentrated in a specific area of interest. A student will be assigned an advisor according to his area of interest.

Students will be encouraged to obtain summer positions which will give them technical laboratory or field experience in their chosen interest area.

The College of Agriculture science requirement will be satisfied by completing the following courses:

	Semester Credit Hours
CHEM 103,104—College Chemistry I, II	4,4
BOTN 100—General Botany	4
ZOOL 101—General Zoology	4

CONSERVATION AND RESOURCE DEVELOPMENT

AGRI 301—Introductory Agricultural Biometrics or AGRI 401—Agricultural Biometrics	3
AGEN 100—Introductory Agricultural Engineering	4
AGRO 202—General Soils	4
BOTN 211—Principles of Conservation	3
ENTM 200—Introductory Entomology	3
GEOG 201—General Geography or GEOL 100—Geology	3
MATH 110,111—Introduction to Mathematics (or MATH 115,140)	3,3
MICB 200—General Microbiology	4

ADDITIONAL REQUIREMENTS—One of the following options must be fulfilled:

PLANT RESOURCE MANAGEMENT

AGRO 100—Crop Production Laboratory	2
BOTN 202—General Botany	4
BOTN 212—Plant Taxonomy	3
BOTN 221—Diseases of Plants	4
BOTN 462—Plant Ecology	2
BOTN 464—Plant Ecology Laboratory	1
HORT 171—Elements of Forestry	3
Botany, Agronomy or related electives	6
Electives	22

FISH AND WILDLIFE MANAGEMENT

ANSC 416—Wildlife Management	3
BOTN 202—General Botany	4
ZOOL 102—Animal Phyla	4
ZOOL 470—Animal Ecology	3
PHYS 121,122—Fundamentals of Physics or MATH 220,221—Elementary Calculus or 1 semester of each	4,4 4,4 4,4
Zoology or equivalent electives	7
Electives	18

RESOURCE MANAGEMENT

AREC 240—Environment and Human Ecology	3*
AREC 452—Economics of Resource Development	3
AREC 250, ECON 205—Elements of Agricultural Economics and Fundamentals of Economics or ECON 201,203—Principles of Economics I, II	3,3 3,3
GEOG 203—Introductory Economic Geography	3
ECOLOGY (BOTN or ZOOL)	3
Electives—in a specialized field (Economics, Government and Politics, Community Development, Landscape Planning, Geography as approved by advisor.)	9
Electives	20

WATER RESOURCE MANAGEMENT

AGEN 432—General Hydrology	3
AGEN 435—Aquacultural Engineering	3
AGRO 413—Soil and Water Conservation	3
AGRO 417—Soil Physics	3
AGRO 423—Soil-Water Pollution	3
GEOG 445—Climatology	3
GEOG 462—Water Resources and Water Resource Planning	3
Ecology (BOTN or ZOOL)	3
Electives	23

PEST MANAGEMENT

AGRO 100—Crop Production Laboratory	2
AGRO 423—Soil-Water Pollution	3
AGRO 453—Weed Control	3
BOTN 202—General Botany	4
BOTN 221—Diseases of Plants	4
ENTM 452—Insecticides	2
ENTM 451—Economic Entomology	4
ZOOL 102—Animal Phyla	4
Electives	21

ENVIRONMENTAL SCIENCE TEACHING

AREC 240—Environment and Human Ecology	*3
AGRO 423—Soil-Water Pollution	3
BOTN 202—General Botany	4
PHYS 121,122—Fundamentals of Physics	4,4
ZOOL 102—Animal Phyla	4
Ecology (BOTN or ZOOL)	3
Genetics (BOTN or ZOOL)	3(4)
EDUC 300—Human Development and Learning	6
EDUC 301—Foundations of Education	3
EDSE 352—Curriculum, Instruction and Observation	3
EDSE 330—Principles and Methods of Secondary Education	3
EDSE 375—Student Teaching in Secondary Schools	8

*Fulfills Social Science Requirement

ENTOMOLOGY

This curriculum prepares students for work in various types of entomological positions. Professional entomologists are engaged in fundamental and applied research, regulatory and control services with state and federal agencies, commercial pest control, sales and development programs with chemical companies, and other commercial organizations, consulting work, extension work, and teaching.

Most of the first two years of this curriculum is devoted to obtaining the essential background. In the junior and senior year there is opportunity for some specializing. Students contemplating graduate work are strongly advised to elect courses in physics, modern language and biometrics.

The College of Agriculture science requirement will be satisfied by completing the following courses:

	Semester Credit Hours
CHEM 103,104—College Chemistry I, II	4,4
ZOOL 101—General Zoology	4
BOTN 100—General Botany	4

DEPARTMENT OF ENTOMOLOGY REQUIREMENTS

ENTM 200—Introductory Entomology	3
ENTM 472—Medical and Veterinary Entomology	4
ENTM 421—Insect Taxonomy and Biology	4
ENTM 432—Insect Morphology	4
ENTM 451—Economic Entomology	4
ENTM 442—Insect Physiology	4
ENTM 399—Special Problems	2
ENTM 498—Seminar	2
BOTN 212—Plant Taxonomy	3
BOTN 221—Diseases of Plants	4
CHEM 201,202—College Chemistry III and College Chemistry Laboratory III	3,2
MATH 110,111—Introduction to Mathematics	6
MICB 200—General Microbiology	4
ZOOL 102—The Animal Phyla or ZOOL 450 Invertebrate Zoology	4
ZOOL 246—Genetics	4
Electives	19

FOOD SCIENCE

Food Science applies the fundamentals of the physical and biological sciences to the problems of procurement, preservation, processing, packaging, and marketing foods in a manner that would satisfy man's needs both nutritionally and aesthetically.

Opportunities for careers in food science exist in areas of meats, milk and milk products, fruits and vegetables, poultry and eggs, sea food, baby foods, confections, pet foods, cereals, flavors and colors, etc. Specific positions in industry, universities, and government, include product development, production, engineering, research, quality control, technical service, technical sales, and teaching.

The College of Agriculture science requirement will be satisfied by completing the following courses:

	Semester Credit Hours
BOTN 100—General Botany or ZOOL 001—General Zoology	4
CHEM 103,104—College Chemistry I,II	4,4
MICB 200—General Microbiology	4

CURRICULUM REQUIREMENTS

AGEN 313—Mechanics of Food Processing	4
ANSC 401—Fundamentals of Nutrition	3
CHEM 201,202—College Chemistry III and College Chemistry Laboratory III	3,2
FDSC 111—Introduction to Food Science	3
FDSC 398—Seminar	1
FDSC 412,413—Principles of Food Processing I, II	3,3
FDSC 421—Food Chemistry	3
FDSC 422—Food Product Research and Development	3
FDSC 431—Statistical Quality Control	3
FDSC 432—Analytical Quality Control	3
FOOD 450—Experimental Food Science	3
MICB 290—Applied Microbiology	4
PHYS 121—Fundamentals of Physics	4
Production course[3]	3
Electives	25

[3] AGEN 100, AGRO 102, ANSC 101, HORT 111 or HORT 222.

GEOLOGY

The geology curriculum is designed to prepare a student either for a career in geology with a Bachelor of Science degree or for advanced studies in geology.

The College of Agriculture science requirement will be satisfied by completing:

	Semester Credit Hours
CHEM 103,104—College Chemistry I, II	4,4
and selecting eight semester credit hours from the following courses:	
PHYS 121,122—Fundamentals of Physics	4,4
MATH 140,141—Analysis I, II	4,4
CHEM 203,204—College Chemistry IV, IV Lab	3,2

DEPARTMENT REQUIREMENTS (GEOLOGY)

GEOL 100—Introduction to Physical Geology	3
GEOL 102—Historical and Stratigraphic Geology	3
GEOL 110—Physical Geology Laboratory	1
GEOL 112—Historical Geology Laboratory	1
GEOL 399—Research Problems in Geology	1
GEOL 422—Mineralogy	3
GEOL 431—Invertebrate Paleontology	3
GEOL 441—Structural Geology	3
GEOL (Proposed)—Summer Field Camp	5
AGRO 202—General Soils	4
Foreign Language—(French, German, Russian)	0-12
Major electives approved by advisor	14
Electives	21

Any departmental requirement may, with the consent of the Geology advisor, be replaced with any of the above courses in PHYS, MATH, or CHEM not already being utilized to satisfy the College of Agriculture science requirement.

HORTICULTURE

The Department of Horticulture offers instruction in pomology (fruits), olericulture (vegetables), floriculture (flowers), ornamental horticulture, and processing of horicultural crops. These courses prepare students to enter commercial production and the horticultural industries such as fruit and vegetable processing, seed production, and retail florists and nurseries. Students are likewise prepared to enter the allied industries as horticultural workers with fertilizer companies, equipment manufacturers and others. Students who wish to enter specialized fields of research and teaching may take advanced work in the department.

The Horticultural Education curriculum is designed for persons who wish to prepare for teaching horticulture in the secondary schools. It provides basic training in horticulture and includes the necessary courses for teacher certification.

The Department of Horticulture is a cooperating department in the Food Science curriculum.

The College of Agriculture science requirement will be satisfied by completing the following courses:

	Semester Credit Hours
CHEM 103,104—College Chemistry I, II	4,4
BOTN 100—General Botany	4
and four semester credits selected from the following:	
MICB 200—General Microbiology	4
ZOOL 101—General Zoology	4
GEOL 100,110—Geology and Physical Geology Laboratory	3,1
CHEM 201,202—College Chemistry III and College Chemistry Laboratory III	3,2

POMOLOGY AND OLERICULTURE CURRICULUM REQUIREMENTS:

AGRO 202—General Soils	4
BOTN 221—Diseases of Plants	4
BOTN 441—Plant Physiology	4
ENTM 252—Insect Pests of Agricultural Crops	4
HORT 111,112—Tree Fruit Production	3,2
HORT 222—Vegetable Production	3
HORT 212—Berry Production	3
HORT 274—Genetics of Cultivated Plants	3
HORT 271—Plant Propagation	3
HORT 411—Technology of Fruits	3
HORT 422—Technology of Vegetables	3
HORT 474—Physiology of Maturation and Storage of Horticultural Crops	2
HORT 398—Seminar	1
A minimum of three additional Horticultural credits	3
Electives	29

FLORICULTURE AND ORNAMENTAL HORTICULTURE CURRICULUM REQUIREMENTS:

	Semester Credit Hours
AGRO 202—General Soils	4
BOTN 212—Plant Taxonomy	3
BOTN 221—Diseases of Plants	4
BOTN 441—Plant Physiology	4
HORT 231—Greenhouse Management	3
HORT 132—Garden Management	3
HORT 160—Introduction to the Art of Landscaping	3
HORT 260—Basic Landscape Composition	2
HORT 271—Plant Propagation	3
HORT 274—Genetics of Cultivated Plants	3
HORT 361—Principles of Landscape Design	3
HORT 451—Technology of Ornamentals	3
HORT 453,454—Woody Plant Materials	3,3
HORT 432—Fundamentals of Greenhouse Crop Production or	
HORT 456—Production and Maintenance of Woody Plants	3
HORT 398—Seminar	1
Select 2 credits from the following	2
HORT 241,242—Greenhouse Crop Production Laboratory	1,1
HORT 142—Garden Management Laboratory	1
Electives	25

HORTICULTURE EDUCATION CURRICULUM REQUIREMENTS:

	Semester Credit Hours
AGRO 202—General Soils	4
BOTN 212—Plant Taxonomy	3
BOTN 221—Diseases of Plants	4
BOTN 441—Plant Physiology	4
EDUC 301—Foundations of Education	3
HORT 231—Greenhouse Management	3
HORT 241—Greenhouse Management Laboratory	1
HORT 132—Garden Management	3
HORT 142—Garden Management Laboratory	1
HORT 160—Introduction to the Art of Landscaping	3
HORT 260—Basic Landscape Composition	2
HORT 271—Plant Propagation	3
HORT 361—Principles of Landscape Design	3
HORT 451—Technology of Ornamentals	3
HORT 398—Seminar	1
RLED 311—Teaching Secondary Agriculture	3
RLED 303—Teaching Materials and Demonstrations	2
RLED 313—Student Teaching	5
RLED 315—Student Teaching	1-4
RLED 302—Introduction to Agricultural Education	2
RLED 305—Teaching Young and Adult Farmer Groups	1
Elect one of the following courses:	3-6
EDHD 460—Educational Psychology (3)	
EDUC 300—Human Development and Learning (6)	
A minimum of 12 additional Agriculture credits	12
Approved Electives	3-9
Total	124

SPECIAL CURRICULA

PRE-FORESTRY

The College of Agriculture is glad to cooperate with any student who wishes to attend the University to pursue courses which may be transferred to a standard forestry curriculum in another institution. The program which a student follows depends to some extent upon the forestry college he plans to enter. All pre-forestry students in the College of Agriculture are sent to the Department of Botany of the University for counsel and advice in these matters.

For residents of Maryland who have completed two years of pre-forestry, have satisfied requirements comparable to those at the University of Maryland and have been accepted in the School of Forestry at North Carolina State University, the University of Maryland will pay the non-resident fee for a period of two years.

The Pre-Forestry Curriculum Includes:

	Semester Credit Hours
ENGL 101,201,202 or equivalent	9
BOTN 100	4
ZOOL 101	4
MATH 110,111,220,221	12
CHEM 103,104	8
PHYS 121,122	8
SPCH 107	2
BOTN 212	3
HORT 171	3
AGRI 101	1
Social Science	6
Economics	3
HLTH 105	2

Students planning for three years in the pre-forestry curriculum should include BOTN 221, ENTM 200, AGRO 102, AGEN 100, AGRO 202, and BOTN 211.

PRE-THEOLOGICAL

The College of Agriculture cooperates with the officers of any theological seminary who desire to urge prospective students to pursue courses in agriculture as a preparation for the rural ministry. Such pre-theological students may enroll for a semester or more or for the usual four-year training of the College. In either case they should enroll as members of the general curriculum in the College of Agriculture. Students desiring to pursue a pre-theological program in the College of Agriculture of the University of Maryland should con-

sult with the president or admissions officer of the theological seminary which they expect to attend.

PRE-VETERINARY

This program is designed for students desiring to prepare for the professional course in veterinary medicine.

A combined degree is available to students in the pre-veterinary curriculum. A student who has completed 90 academic semester credits at the University of Maryland and who has completed 30 additional academic semester credits at any accredited veterinary college is eligible to make application for the Bachelor of Science degree from the University of Maryland.

Students wishing to apply for the combined degree must have completed all University and college requirements as set forth on page — and must also have completed additional credits in animal science.

The University of Maryland has an agreement with the University of Georgia, Ohio State University and Tuskegee Institute. Up to eleven spaces per year are reserved for Maryland residents in the College of Veterinary Medicine, University of Georgia; six spaces in the College of Veterinary Medicine, Ohio State University; and two spaces in the College of Veterinary Medicine at the Tuskegee Institute. The spaces are to be filled on a competitive basis from among qualified applicants.

Candidates, to be eligible for consideration must:

a. Complete the curriculum shown below with grades not less than C in any subject and a minimum grade point average of 2.5;
b. Take the veterinary medical aptitude test; and
c. Be a resident of Maryland. (See definition of Residence and Non-Residence).

All requirements for admission must be completed prior to matriculation in the College of Veterinary Medicine. After applications have been received, academic records will be summarized and an evaluation of the applicant will be completed. The complete file will be forwarded to the College of Veterinary Medicine, University of Georgia. The College of Veterinary Medicine will invite selected applicants to the University of Georgia for interviews. Similar information on applicants will be made available to the College of Veterinary Medicine, Ohio State University and the College of Veterinary Medicine, Tuskegee Institute.

The Colleges of Veterinary Medicine, University of Georgia, Ohio State University and Tuskegee Institute have the final authority on all matters related to admission. Applicants will be advised by the respective colleges after final evaluations have been made.

Minimum requirements for admission to the Colleges of Veterinary Medicine, University of Georgia and Ohio State University are:

English	6
Biology	8
Physics	8
Chemistry	13
Humanities and Social Sciences	15
Mathematics	6
Electives (zoology, physics, chemistry, genetics or animal science)	6

Pre-veterinary curriculum Combined Degree Requirements:

Biological Sciences	12
Botany (4)	
Zoology (8)	
English and Speech	12
Physical Sciences	30
Chemistry (13)	
Mathematics (6)	
Physics (8)	
Animal Science	15
Genetics	3
Nutrition	3
Social Science	6
History	6
Electives	6
Physical Education	2
Health	2

TWO-YEAR PROGRAM—INSTITUTE OF APPLIED AGRICULTURE

The programs of study offered by the Institute of Applied Agriculture will assist men and women interested in preparing for specific jobs in the broad fields of applied science and business in agriculture. Programs currently offered are entitled: business farming, turfgrass and golf course management; ornamental horticulture and nursery management. Courses taken in these programs are not transferable for degree credits at the University of Maryland. However, students satisfactorily completing two years of study will be awarded an appropriate certificate. For additional information write: Director, Institute of Applied Agriculture, University of Maryland, College Park, Md. 20742.

COURSE OFFERINGS

AGRICULTURE

AGRI 101, (001). INTRODUCTION TO AGRICULTURE. (1)
First semester. Required of all beginning freshmen and sophomores in agriculture. Other students must get the consent of the instructor. A series of lectures, introducing the student to the broad field of agriculture.
(Poffenberger)

AGRI 301, (080). INTRODUCTION TO AGRICULTURAL BIOMETRICS (3)
First semester. Two lectures and one laboratory period per week. Prerequisite, University math requirement. Descriptive statistics, sampling, confidence interval estimation, introduction to hypothesis testing, simple regression and correlation. Course emphasis shall be in application of simple statistical techniques and on interpretation of the statistical results. (Douglass)

AGRI 401, (101). AGRICULTURAL BIOMETRICS. (3)
First semester. Two lectures and one laboratory period per week. Prerequisite, MATH 115 or equivalent. Probability, measures of central tendency and dispersion, frequency distributions, tests of statistical hypotheses, regression analyses, multiway analysis with emphasis on the use of statistical methods in agricultural research.
(Douglass)

AGRI 489, (197). SPECIAL TOPICS IN AGRICULTURE. (1-3)
First or second semester. Credit according to time scheduled and organization of the course. A lecture series organized to study in depth a selected phase of agriculture not normally associated with one of the existing programs. (Staff))

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

AGRI 601, (205). DESIGN OF EXPERIMENTS. (3) (Staff)
AGRI 602, (201). ADVANCED AGRICULTURAL BIOMETRICS. (3) (Douglass)
AGRI 604, (206)). STATISTICAL METHODS IN BIOLOGICAL ASSAY. (3) (Staff)
AGRI 607, (207). APPLICATION OF LEAST SQUARES METHOD. (3) (Staff)
AGRI 702, (210). EXPERIMENTAL PROCEDURES IN THE AGRICULTURAL SCIENCES. (3) (Staff)

AGRICULTURAL ENGINEERING

Professors: Green, Harris and Winn.
Associate Professors: Cowan, Felton and Merrick.
Assistant Professors: Hummel, Merkel and Rebuck.
Instructors: Brodie, Rice, Seibel and Stewart.
Research Associate: Wheaton.
Visiting Research Associate: Willson.

AGEN 100 (001). INTRODUCTION TO AGRICULTURAL ENGINEERING. (4)
First and second semesters. Three lectures and one laboratory per week. Applications of mathematics, physics and engineering techniques in the solution of agricultural engineering problems. Studies will include farm power and machinery, farm structures and electrification and soil and water conservation. (Hummel and Merkel)
AGEN 200 (056). INTRODUCTION TO FARM MECHANICS. (2)
First and second semesters. One lecture and one laboratory period a week. A study of the hand tools and power equipment and their safe use as it applies to mechanized farms. Principles and practice in arc and gas welding, cold metal and sheet metal work are provided. Also, tool fitting, woodworking, plumbing, blue print reading and use of concrete. (Seibel)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

AGEN 305 (104). FARM MECHANICS. (2)
First semester. Two laboratory periods a week. Available only to seniors in agricultural education. This course consists of laboratory exercises in practical farm shop and farm equipment maintenance, repair, and construction projects, and a study of the principles of shop organization and administration. (Seibel)
AGEN 313 (113). MECHANICS OF FOOD PROCESSING. (4)
First semester. Three lectures and one laboratory. Prerequisite, PHYS 111 or 121. Applications in the processing and preservation of foods of power transmission, hydraulics, electricity, thermodynamics, refrigeration, instruments and controls, materials handling and time and motion analysis. (Cowan)
AGEN 324 (121). ENGINEERING DYNAMICS OF BIOLOGICAL MATERIALS. (3)
Second semester. Three lectures per week. Prerequisite ENME 340. Investigates the physical parameters (impact, temperature, humidity, light, etc.) governing the response of biological materials. Analysis of unit operations and their effect on the physical and quality characteristics of agricultural products. (Cowan)
AGEN 343 (143). FUNCTIONAL DESIGN OF MACHINERY AND EQUIPMENT. (3)
First semester. Two lectures and one two hour laboratory per week. Prerequisite ENES 221. Theory and methods of agricultural machine design. Application of machine design principles and physical properties of soils and agricultural products in design of machines to perform specific tasks. (Hummel)
AGEN 401 (123). AGRICULTURAL PRODUCTION EQUIPMENT. (3)
First semester. Two lectures and one laboratory per week. Prerequisite, AGEN 100. Principles of operation and functions of power and machinery units as related to tillage; metering devices; cutting, conveying and separating units; and control mechanisms. Principles of internal combustion engines and power unit components. (Hummel)
AGEN 402 (124). AGRICULTURAL MATERIALS HANDLING AND ENVIRONMENTAL CONTROL. (3)
Second semester. Two lectures and one laboratory per week. Prerequisite, AGEN 100. Characteristics of construction materials and details of agricultural structures. Fundamentals of electricity, electrical circuits, and electrical controls. Materials handling and environmental requirements of farm products and animals. (Staff)
AGEN 421 (144). POWER SYSTEMS. (3)
First semester. Two lectures and one two hour laboratory per week. Prerequisites, ENME 216, ENEE 300 and ENME 340. Analysis of energy conversion devices including internal combustion engines, electrical and hydraulic motors. Fundamentals of power transmission and coordination of power sources with methods of power transmission. (Harris)
AGEN 422 (145). SOIL AND WATER ENGINEERING. (3)
Second semester. Three lectures per week. Prerequisite, ENME 340. Applications of engineering and soil sciences in erosion control, drainage, irrigation and watershed management. Principles of agricultural hydrology and design of water control and conveyance systems. (Rebuck)
AGEN 424 (142). FUNCTIONAL AND ENVIRONMENTAL DESIGN OF AGRICULTURAL STRUCTURES. (3)
Second semester. Two lectures and one two hour laboratory per week. Prerequisite, AGEN 324. An analytical approach to the design and planning of functional and environmental requirements of plants and animals in semi- or completely enclosed structures. (Merkel)
AGEN 432 (165). GENERAL HYDROLOGY. (3)
Second semester. Three lectures per week. Qualitative aspects of basic hydrologic principles pertaining to the properties, distribution and circulation of water as related to public interest in water resources. (Rebuck)
AGEN 433 (175). ENGINEERING HYDROLOGY. (3)
First semester. Three lectures per week. Prerequisites; MATH 246, ENCE 330 or ENME 340. Properties, distribution and circulation of water from the sea and in the atmosphere emphasizing movement overland, in channels and through the soil profile. Qualitative and quantitative factors are considered. (Rebuck)
AGEN 435 (185). AQUACULTURAL ENGINEERING. (3)
Spring semester. Prerequisite, consent of department. A study of the engineering aspects of development, utilization and conservation of aquatic systems. Emphasis will be on harvesting and processing aquatic animals or plants as related to other facets of water resources management. (Wheaton)
AGEN 489 (189). SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING. (1-3)
Prerequisite, approval of department. Student will select an engineering problem and prepare a technical report. The problem may include design, experimentation, and or data analysis. (Staff)
AGEN 499 (198). SPECIAL PROBLEMS IN FARM MECHANICS. (1-3)
First and second semesters. Prerequisite, approval of department. Not acceptable for majors in agricultural engineering. Problems assigned in proportion to credit. (Staff))

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

AGEN 601 (201). INSTRUMENTATION SYSTEMS. (3) (Staff)
AGEN 602 (203). MECHANICAL PROPERTIES OF BIOLOGICAL MATERIALS. (3)
AGEN 603 (202). BIOLOGICAL PROCESS ENGINEERING. (3) (Staff)
AGEN 605 (204). LAND AND WATER RESOURCE DEVELOPMENT ENGINEERING. (3) (Staff)
AGEN 698 (302). SEMINAR. (1, 1) (Staff)
AGEN 699 (301). SPECIAL PROBLEMS IN AGRICULTURAL AND AQUACULTURAL ENGINEERING. (1-6) (Staff)
AGEN 799 (399). RESEARCH. (1-6) (Staff)
AGEN 899 (499). RESEARCH. (1-6) (Staff)

AGRICULTURAL AND EXTENSION EDUCATION

Professor: Ryden.
Associate Professors: Longest and Nelson.

FOR ADVANCED UNDERGRADUATES

RLED 302 (107). INTRODUCTION TO AGRICULTURAL EDUCATION. (2)
An overview of the job of the teacher of agriculture; examination of agricultural education programs for youth and adults. (Staff)

RLED 303 (101). TEACHING MATERIALS AND DEMONSTRATIONS. (2)
First semester. Principles and practices of the demonstration method: construction and use of visual aids in teaching agriculture. (Nelson)

RLED 305 (111). TEACHING YOUNG AND ADULT FARMER GROUPS. (1)
First semester. Characteristics of young and adult farmer instruction in agriculture. Determining needs for and organizing a course; selecting materials for instruction; and class management. Emphasis is on the conference method of teaching. (Staff)

RLED 311 (109). TEACHING SECONDARY VOCATIONAL AGRICULTURE. (3)
Frst semester. A comprehensive course in the work of high school departments of vocational agriculture. It emphasizes particularly placement, supervised farming programs, the organization and administration of Future Farmer activities, and objectives and methods in all-day instruction. (Nelson)

RLED 313 (103). STUDENT TEACHING. (5)
First semester. Prerequisite, satisfactory academic average and permission of instructor. Fulltime student teaching in an off-campus student teaching center under an approved supervising teacher of agriculture. Participating experience in all aspect of the work of a teacher of agriculture. (Nelson)

RLED 315 (104). STUDENT TEACHING. (1-4)
First semester. Prerequisite, satisfactory academic average and permission of insrtuctor. Fulltime observation and participation in work of teacher of agriculture in off-campus student teaching center. Provides students opportunity to gain experience in the summer program of work, to participate in opening of school activities, and to gain other experience needed by teachers. (Nelson)

RLED 323 (161). 4-H ORGANIZATION AND PROCEDURE. (2)
A study of the youth phase of cooperative extension work. Emphasis is placed on the philosophy, objectives, organization, leadership development and methods used in conducting 4-H Club work at the local and county level. (Ryden)

RLED 325 (121). DIRECTED EXPERIENCE IN EXTENSION EDUCATION. (1-5)
Prerequisite, satisfactory academic average and permission of instructor. Full-time observation and participation in selected aspects of extension education in an approved training county. (Ryden)

RLED 398 (199). SEMINAR IN AGRICULTURAL EDUCATION. (1)
Examination of current literature, reports and discussions of problems, trends, and issues in agricultural education. (Staff)

RLED 422 (150). EXTENSION EDUCATION. (2)
Second semester. The Agricultural Extension Service as an educational agency. The history, philosophy, objectives, policy, organization, legislation and methods used in Extension work. (Ryden)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

RLED 423 (160). EXTENSION COMMUNICATIONS. (2)
First semester. An introduction to communications in teaching and within an organization, including barriers to communication, the diffusion process and the application of communication principles person to person, with groups and through mass media. (Ryden)

RLED 426 (185). DEVELOPMENT AND MANAGEMENT OF EXTENSION YOUTH PROGRAMS. (3)
Designed for present and prospective state leaders of extension youth programs. Program develompent, principles of program management, leadership development and counseling; science, career selection and citizenship in youth programs, field experience in working with low income families' youth, urban work. (Ryden)

RLED 464 (114). RURAL LIFE IN MODERN SOCIETY. (3)
Examination of the many aspects of rural life that affect and are affected by changes in technical, natural and human resources. Emphasis is placed on the role which diverse organizations, agencies and institutions play in the education and adjustment of rural people to the demands of modern society. (Longest)

RLED 487, 497 (170, 171). CONSERVATION OF NATURAL RESOURCES. (3, 3)
Laboratory fee, $35.00. Designed primarily for teachers. Study of state's natural resources—soil, water, fisheries, wildlife, forests, and minerals—natural resources problems and practices. Extensive field study. First course concentrates on subject matter; second includes methods of teaching conservation. Courses taken concurrently in summer season. (Staff)

RLED 488, 489 (180, 181). CRITIQUE IN RURAL EDUCATION. (1, 1)
Current problems and trends in rural education.

RLED 499 (198). SPECIAL PROBLEMS. (1-3)
Prerequisite, staff approval. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

RLED 606 (217). PROGRAM PLANNING AND EVALUATION IN AGRICULTURAL EDUCATION. (2-3) (Staff))
RLED 626 (225). PROGRAM DEVELOPMENT IN EXTENSION EDUCATION. (2) (Staff)
RLED 642 (209). RURAL ADULT EDUCATION. (2) (Staff)
RLED 661 (201). RURAL COMMUNITY ANALYSIS. (3) (Staff))
RLED 663 (204). DEVELOPING RURAL LEADERSHIP. (2-3) (Staff))
RLED 689, 789 (207, 208). SPECIAL TOPICS IN RURAL EDUCATION. (2, 2) (Staff)
RLED 691 (200). RESEARCH METHODS IN RURAL EDUCATION. (2-3) (Staff)
RLED 699 (301). SPECIAL PROBLEMS. (1-3) (Staff)
RLED 707 (215). SUPERVISION OF STUDENT TEACHING. (1) (Staff)
RLED 798 (302). SEMINAR IN RURAL EDUCATION. (1, 1) (Staff)
RLED 799 (399). MASTER'S THESIS. (1-6) (Staff)
RLED 882 (240). AGRICULTURAL COLLEGE INSTRUCTION. (1) (Staff)
RLED 899 (499). PH.D. DISSERTATION. (Cr Arr) (Staff)

AGRICULTURAL AND RESOURCE ECONOMICS

Professor and Department Chairman: Curtis.
Professors: Beal, Bishop, Foster, Ishee, Moore, Murray, Poffenberger, Smith, Stevens, Tuthill, Walker and Wysong.
Associate Professors: Bender, Cain, Hardie, Lessley and Via.
Assistant Professors: Beiter, Hoecker, Holmes, Lawrence and Marasco.
Visiting Professors: Evans and Waugh.
Visiting Associate Professor: Bell.
Visiting Assistant Professors: Nash, Noetzel and Sokoloski.

AREC 240 (040). ENVIRONMENT AND HUMAN ECOLOGY. (3)
Pollution and human crowding in the modern environment. Causes and ecological costs of these problems. Public policy approaches to the solution of problems in environment and human ecology. (Foster)

AREC 250 (050). ELEMENTS OF AGRICULTURAL ECONOMICS. (3)
First semester. An introduction to economic principles of production, marketing, agricultural prices and incomes, farm labor, credit, agricultural policies, and government programs. (Ishee)

AREC 251 (051). MARKETING OF AGRICULTURAL PRODUCTS. (3)
Second semester. The development of marketing, its scope, channels, and agencies of distribution, functions, costs, methods used and services rendered. (Hardie)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

AREC 300, 301 (100, 101). AGRICULTURAL ESTIMATING METHODOLOGY. (3, 3)
First and second semesters respectively. The history, organization and administration of, and services provided by the Statistical Reporting Service of the U. S. Department of Agriculture and the survey sampling methods used by that agency for computing the department's official statistics on crops, livestock and livestock products, production, agricultural prices and farm employment. Emphasis is on statistical procedures used for preparing approximately 350 reports issued annually by the Crop Reporting Board of the U. S. Statistical Reporting Service. (Designed especially for foreign students in FAO and AID-Program of Technical Cooperation but very beneficial to any student interested in the area.) (Bookhout)

AREC 398 (199). SEMINAR. (1, 1)
First and second semesters. Students will obtain experience in the selection, preparation and presentation of economic topics and problems which will be subjected to critical analysis. (Ishee)

AREC 399 (198). SPECIAL PROBLEMS. (1-2) (2 cr. max.)
First and second semesters and summer. Concentrated reading and study in some phase or problem in agricultural economics. (Staff)

AREC 404 (106). PRICES OF AGRICULTURAL PRODUCTS. (3)
Second semester. An introduction to agricultural price behavior. Emphasis is placed on the use of price information in the decision-making process, the relation of supply and demand in determining agricultural prices, and the relation of prices to grade, time, location, and stages of processing in the marketing system. The course includes elementary methods of price analysis, the concept of parity and the role of price support programs in agricultural decisions. (Marasco)

AREC 406 (108). FARM MANAGEMENT. (3)
Second semester. The organization and operation of the farm business to obtain an income consistent with family resources and objectives. Principles of production economics and other related fields are applied to the individual farm business. Laboratory period will be largely devoted to field trips and other practical exercises. (Lessley)

AREC 407 (107). FINANCIAL ANALYSIS OF THE FARM BUSINESS. (3)
First semester. Application of economic principles to develop criteria for a sound farm business, including credit source and use, preparing and filing income tax returns, methods of appraising farm properties, the summary and analysis of farm records, leading to effective control and profitable operation of the farm business. (Wysong)

AREC 414 (103). INTRODUCTION TO AGRICULTURAL BUSINESS MANAGEMENT. (3)
First semester, alternate years. The different forms of businesses are investigated. Management functions, business indicators, measures of performance, and operational analysis are examined. Case studies are used to show applications of management techniques. (Lessley)

AREC 416 (118). MARKETING MANAGEMENT OF AGRIBUSINESS ENTERPRISES. (3)
Second semester, (alternate years). Prerequisite, AREC 414 or permission of instructor. Principles, functions, institutions and channels of marketing viewed from the perspective of a manager of an agricultural business enterprise. The managerial framework for analyzing the entire marketing program of a firm is developed and utilized. (Cain)

AREC 427 (117). AGRICULTURAL COMMODITY MARKETS: AN ECONOMIC ANALYSIS. (3)
First semester, (alternate years). Problems, institutions and functions within marketing systems for poultry and eggs, dairy, grain, horticultural, livestock, tobacco and forestry products. Practical applications of elementary economic theory in a framework for analysis of market problems. (Via)

AREC 432 (112). AGRICULTURAL POLICY AND PROGRAMS. (3)
First semester. A study of public policies and programs related to the problems of agriculture. Description analysis and appraisal of current policies and programs will be emphasized. (Beal)

AREC 444 (114). WORLD AGRICULTURAL PRODUCTION AND TRADE. (3)
First semester. World production, consumption, and trade patterns for agricultural products. International trade theory applied to agricultural products. National influences on international agricultural trade. (Foster)

AREC 445 (119). FOREIGN AGRICULTURAL ECONOMIES. (3)
Second semester. Analysis of the agricultural economy of selected areas of the world. The interrelationships among institutions and values, such as government and religion, and the economics of agricultural organization and production. (Holmes)

AREC 452 (111). ECONOMICS OF RESOURCE DEVELOPMENT. (3)
First semester. Economic, political, and institutional factors which influence the use of land resources. Application of elementary economic principles in understanding social conduct concerning the development and use of natural and man-made resources. (Tuthill)

AREC 484 (109). INTRODUCTION TO ECONOMETRICS IN AGRICULTURE. (3)
First semester. An introduction to the application of econometric techniques to agricultural problems with emphasis on the assumptions and computational techniques necessary to derive statistical estimates, test hypotheses, and make predictions with the use of single equation models. Includes linear and non-linear regression models, internal least squares, discriminant analysis and factor analysis. (Ishee)

AREC 485 (185). APPLICATIONS OF MATHEMATICAL PROGRAMMING IN AGRICULTURE, BUSINESS AND ECONOMIC ANALYSIS. (3)
This course is designed to train students in the application of mathematical programming (especially linear programming) to solve a wide variety of problems in agriculture, business and economics. The primary emphasis is on setting up problems and interpreting results. The computational facilities of the Computer Science Center are used extensively. (Bender)

AREC 495 (195). HONORS READING COURSE IN AGRICULTURAL ECONOMICS I. (3)
First semester. Selected readings in political and economic theory from 1700 to 1850. This course develops a basic understanding of the development of economic and political thought as a foundation for understanding our present society and its cultural heritage. Prerequisite, acceptance in the Honors Program of the Department of Agricultural Economics. (Bender)

AREC 496 (196). HONORS READING COURSE IN AGRICULTURAL ECONOMICS II. (3)
Second semester. Selected readings in political and economic theory from 1850 to the present. This course continues the development of a basic understanding of economic and political thought begun in AREC 495. This understanding on the part of the student is further developed and broadened in this semester by the examination of modern problems in agricultural economics in the light of the material read and discussed in AREC 495 and AREC 496. Prerequisite: Successful completion of AREC 495 and registration in the Honors Program of the Department of Agricultural Economics. (Via)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

AREC 689 (300). SPECIAL TOPICS IN AGRICULTURAL ECONOMICS. (3) (Staff)
AREC 698 (302). SEMINAR. (1, 1) (Staff)
AREC 699 (301). SPECIAL PROBLEMS IN AGRICULTURAL ECONOMICS. (1-2) (4 cr. max.) (Staff)
AREC 799 (399). RESEARCH. (6 hrs. M. S.) (Staff)
AREC 804 (210). ADVANCED AGRICULTURAL PRICE AND DEMAND ANALYSIS. (3) (Staff)
AREC 806 (216). ECONOMICS OF AGRICULTURAL PRODUCTION. (3) (Staff)
AREC 814 (204). ADVANCED AGRIBUSINESS MANAGEMENT. (3) (Staff)
AREC 822 (202). MARKET STRUCTURE IN AGRICULTURE. (3) (Staff)
AREC 824 (214). ADVANCED AGRICULTURAL MARKETING. (3) (Staff)
AREC 832 (208). AGRICULTURAL PRICE AND INCOME POLICY. (3) (Staff)
AREC 844 (201). ADVANCED THEORY AND PRACTICE OF INTERNATIONAL AGRICULTURAL TRADE. (3) (Staff)
AREC 845 (212). AGRICULTURE IN WORLD ECONOMIC DEVELOPMENT. (3) (Staff)
AREC 846 (220). INTERNATIONAL IMPACTS OF SELECTED AGRICULTURAL FORCES. (3) (Staff)
AREC 852 (219). ADVANCED RESOURCE ECONOMICS. (3) (Staff)
AREC 883 (218). AGRICULTURAL ECONOMICS RESEARCH TECHNIQUES. (3) (Staff)
AREC 885 (200). APPLICATION OF ECONOMETRICS IN AGRICULTURE. (3) (Staff)
AREC 899 (499). RESEARCH (12 hours. Ph.D.) (Staff)

AGRONOMY—CROPS AND SOIL

Professor and Department Chairman: J. Miller.
Professors: Axley, Clark, Decker, Hoyert and Strickling.
Associate Professors: Fanning, Foss, F. Miller, Schillinger.
Assistant Professors: Aycock, Bezdicek, Burt, Mulchi, Newcomer, Powell.

CROPS

AGRO 100 (002). CROP PRODUCTION LABORATORY. (2)
First and second semesters. Two laboratory periods a week. Demonstration and application of practices in the identification, distribution and management of field crops. (Clark)

AGRO 102 (001). CROP PRODUCTION. (2)
Second semester. Prerequisite, AGRO 100 or concurrent enrollment therein. Culture, use, improvement, adaptation, distribution, and history of field crops. (Clark)

AGRO 103 (003). WORLD CROPS AND FOOD SUPPLY. (3)
Second semester. An introduction to the relationship of crops with civilization. The past, present, and future interactions between the biology of crop plants and world affairs and population will be studied. The future impact of crops on world affairs will be emphasized. (Clark)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

AGRO 403 (103). CROP BREEDING. (3)
First semester, alternate years. (Offered 1972-73) Prerequisite, BOTN 414 or ZOOL 246. Principles and methods of breeding annual self and cross-pollinated plant and perennial forage species. (Schillinger)

AGRO 404 (104). TOBACCO PRODUCTION. (3)
Second semester. Prerequisite, BOTN 100. A study of the history, adaptation, distribution, culture, and improvement of various types of tobacco, with special emphasis on problems in Maryland tobacco production. Physical and chemical factors associated with yield and quality of tobacco will be stressed. (Hoyert)

AGRO 405 (109). TURF MANAGEMENT. (3)
First semester, alternate years. (Offered 1971-72) Two lectures and one laboratory period per week. Prerequisite, BOTN 100. A study of principles and practices of managing turf for lawns, golf courses, athletic fields, playgrounds, airfields and highways for commercial sod production. (Powell)

AGRO 406 (108). FORAGE CROP PRODUCTION. (2)
Second semester. Prerequisite, BOTN 100, AGRO 100 or concurrent enrollment therein. Study of the production and management of grasses and legumes for quality hay, silage, and pasture. (Decker)

AGRO 407 (107). CEREAL CROP PRODUCTION. (2)
First semester, alternate years. (Offered 1972-73) Prerequisite, BOTN 100, AGRO 100 or concurrent enrollment therein. Study of the principles and practices of corn, wheat, oats, barley, rye, and soybean production.

AGRO 451 (151). CROPPING SYSTEMS. (2)
First semester. Prerequisite, AGRO 102 or equivalent. The coordination of information from various courses in the development of balanced cropping systems, appropriate to different objectives in various areas of the state and nation. (Clark)

AGRO 452 (152). SEED PRODUCTION AND DISTRIBUTION. (2)
Second semester, alternate years. (Offered 1972-73) One lecture and one laboratory period a week. Prerequisite, AGRO 102 or equivalent. A study of seed production, processing, and distribution; federal and state seed control programs; seed laboratory analysis; release of new varieties; and maintenance of foundation seed stocks. (Newcomer)

AGRO 453 (154). WEED CONTROL. (3)
First semester, alternate years. (Offered 1971-72) Two lectures and one laboratory period a week. Prerequisite, AGRO 102 or equivalent. A study of the use of cultural practices and chemical herbicides in the control of weeds. (Burt)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

AGRO 601, 602 (201, 202). ADVANCED CROP BREEDING (2, 2) (Schillinger, Aycock)
AGRO 608 (208). RESEARCH METHODS. (2) (Staff)
AGRO 802 (203). BREEDING FOR RESISTANCE TO PLANT PESTS. (3) (Schillinger)
AGRO 804 (204). TECHNIC IN FIELD CROP RESEARCH. (2) (Staff)
AGRO 805 (205). ADVANCED TOBACCO PRODUCTION. (2)
AGRO 806 (254). HERBICIDE CHEMISTRY AND PHYSIOLOGY. (2) (Burt)
AGRO 807 (207). ADVANCED FORAGE CROPS. (2) (Decker)

Additional courses under CROPS AND SOILS.

SOILS

AGRO 105 (005). SOIL AND THE ENVIRONMENT. (3)
First semester. A study of soils as an irreplaceable natural resource, importance of soils in the ecosystem, and analysis of land resource areas in the U. S. Discussion of soils as a pollutant and the pollution of soils by various agents and the role of soil as a medium for storage, decontamination or inactivation of pollutants. (Foss)

AGRO 202 (010). GENERAL SOILS. (4)
Second semester. Three lectures and one laboratory period a week. Prerequisite, CHEM 103 or permission of instructor. A study of the fundamentals of soils including their origin, development, relation to natural sciences, effect on civilization, physical properties, and chemical properties. (Foss)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

AGRO 411 (111). SOIL FERTILITY PRINCIPLES. (3)
First semester, alternate years. (Offered 1972-73) Prerequisite, AGRO 202. A study of the chemical, physical, and biological characteristics of soils that are important in growing crops. Soil deficiencies of physical, chemical, or biological nature and their correction by the use of lime, fertilizers, and rotations are discussed and illustrated. (Strickling)

AGRO 412 (112). COMMERCIAL FERTILIZERS. (3)
Second semester. Prerequisites, AGRO 202 or permission of instructor. A study of the manufacturing of commercial fertilizers and their use in soils for efficient crop production. (Axley)

AGRO 413 (113). SOIL AND WATER CONSERVATION. (3)
First semester, alternate years. (Offered 1972-73) Two lectures and one laboratory period a week. Prerequisite, AGRO 202 or permission of instructor. A study of the importance and causes of soil erosion, methods of soil erosion control, and the effect of conservation practices on soil-moisture supply. Special emphasis is placed on farm planning for soil and water conservation. The laboratory period will be largely devoted to field trips. (Foss)

AGRO 414 (114). SOIL CLASSIFICATION AND GEOGRAPHY. (3)
Second semester. Three lectures and one laboratory period a week. Prerequisite, AGRO 202 or permission of instructor. A study of the genesis, morphology, classification and geographic distribution of soils. The broad principles governing soil formation are explained. Attention is given to the influence of geographic factors on the development and use of the soils in the United States and other parts of the world. The laboratory periods will be largely devoted to the field trips and to a study of soil maps of various countries. (Fanning)

AGRO 415 (115). SOIL SURVEY AND LAND USE. (3)
First semester, alternate years. (Offered 1971-72) Two lectures and one laboratory period a week. An introduction to soil survey interpretation as a tool in land use both in agricultural and urban situations. The implications of soil problems as delineated by soil surveys on land use will be considered. (F. Miller)

AGRO 417 (117). SOIL PHYSICS. (3)
First semester, alternate years. (Offered 1971-72) Two lectures and one laboratory period a week. Prerequisite, AGRO 202 and a course in physics, or permission of Instructor. A study of physical properties of soils with special emphasis on relationship to soil productivity. (Strickling)

AGRO 421 (116). SOIL CHEMISTRY. (3)
First semester, alternate years. (Offered 1972-73) One lecture and two laboratory periods a week. Prerequisite, AGRO 202 or permission of instructor. A study of the chemical composition of soils; cation and anion exchange; acid, alkaline and saline soil conditions; and soil fixation of plant nutrients. Chemical methods of soil analysis will be studied with emphasis on their relation to fertilizer requirements. (Axley)

AGRO 422 (118). SOIL BIOCHEMISTRY. (3)
Second semester, alternate years. (Offered 1972-73) Two lectures and one laboratory period a week. Prerequisite, AGRO 202, CHEM 104 or consent of instructor. A study of biochemical processes involved in the formation and decomposition of organic soil constitutents. Significance of soil-biochemical processes involved in plant nutrition will be considered. (Bezdicek)

AGRO 423 (119). SOIL-WATER POLLUTION. (3)
Second semester. Prerequisite, background in biology and CHEM 104. Reaction and fate of pesticides, agricultural fertilizers, industrial and animal wastes in soil and water will be discussed. Their relation to the environment will be emphasized. (Bezdicek)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

AGRO 722 (253). ADVANCED SOIL CHEMISTRY. (3) (Axley)
AGRO 821 (251). ADVANCED METHODS OF SOIL INVESTIGATION. (3) (Axley)
AGRO 831 (250). ADVANCED SOIL MINERALOGY. (3) (Fanning)
AGRO 832 (252). ADVANCED SOIL PHYSICS. (3) (Strickling)

CROPS AND SOILS

FOR ADVANCED UNDERGRADUATES AND GRADUATES

AGRO 398 (199). SENIOR SEMINAR. (1)
First semester. Reports by seniors on current scientific and practical publications pertaining to agronomy. (J. Miller)

AGRO 499 (198). SPECIAL PROBLEMS IN AGRONOMY. (1-3 var. cr.)
First and second semesters. Prerequisites, AGRO 202, 406, 407 or permission of instructor. A detailed study, including a written report of an important problem in agronomy. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

AGRO 789 (260). RECENT ADVANCES IN AGRONOMY. (2-4) (Staff)
AGRO 798 (302). AGRONOMY SEMINAR. (1, 1) (Staff)
AGRO 799 (399). THESIS RESEARCH. (Master's Level) (1-4) (Staff)
AGRO 899 (499). DISSERTATION RESEARCH. (Doctoral Level) (Staff)

ANIMAL SCIENCE

Animal

Professor and Department Chairman: Young.
Professors: Green and Leffel.
Associate Professor: Buric.
Assistant Professor: DeBarthe.

Dairy

Professor and Chairman: Davis.
Professor: Williams.
Associate Professor: Vandersall.
Assistant Professors: Buchman, Bull and Douglass.

Poultry

Professor and Department Chairman: Shaffner.
Professor: Godfrey.
Associate Professors: Bigbee and Creek.
Assistant Professors: Heath, Pollard and Thomas.

Veterinary Science

Chairman of Department: Ladson.
Associate Professors: Marquardt, Mohanty and Newman.
Assistant Professors: Albert and Ingling.

ANSC 101 (001). PRINCIPLES OF ANIMAL SCIENCE. (3)
First semester. Two lectures and one, two-hour laboratory period per week. A comprehensive course, including the development of animal science, its contributions to the economy, characteristics of animal products, factors of efficient and economical production and distribution. (Young)

ANSC 201. BASIC PRINCIPLES OF ANIMAL GENETICS. (3)
First semester. Two lectures and one laboratory period per week. The basic principles and laws of Mendelian genetics as applied to economically important domestic animals. Included will be gene action and interaction, linkage and crossing over, recombination, cytological maps, chromosomal aberrations, mutations, structure of the genetic material and regulation of genetic information. (Staff)

ANSC 203 (010). FEEDS AND FEEDING. (3)
First semester. Credit not allowed for ANSC major. Two lectures and one laboratory period per week. Prerequisites, CHEM 103, 104. Elements of nutrition, source, characteristics and adaptability of the various feedstuffs to the several classes of livestock. A study of the composition of feeds, the nutrient requirements of farm animals and the formulation of economic diets and rations for livestock. (Leffel)

ANSC 221 (020). FUNDAMENTALS OF ANIMAL PRODUCTION. (3)
First semester. Two lectures and one laboratory period per week. This course deals with the adaptation of beef cattle, sheep, swine and horses to significant and specific uses. Breeding, feeding, management practices and criteria for evaluating usefulness are emphasized. (DeBarthe)

ANSC 222 (022). LIVESTOCK EVALUATION. (3)
Second semester. Two lectures and one laboratory period per week. Prerequisite, ANSC 221 or permission of instructor. A study of type and breed characteristics of beef cattle, sheep and swine and the market classes of livestock which best meet present day demands. One field trip of about two days duration is made during which students participate in the Annual Eastern Intercollegiate Livestock Clinic. (Buric)

ANSC 223 (021). SEMINAR. (1)
First semester. One lecture per week. Reviews, reports and discussions of pertinent subjects in animal science. (Staff)

ANSC 242 (040). DAIRY PRODUCTION. (3)
Second semester. Two lectures and one laboratory period per week. Prerequisite, ANSC 101. A comprehensive course in dairy breeds, selection of dairy cattle, dairy cattle nutrients, feeding and management. (Buchman)

ANSC 244 (041). DAIRY CATTLE TYPE APPRAISAL. (1)
Second semester. Freshmen, by permission of instructor. Two laboratory periods. Analysis of dairy cattle type with emphasis on the comparative judging of dairy cattle. (Cairns)

ANSC 261 (061). ADVANCED POULTRY JUDGING. (1)
First semester. Prerequisite, ANSC 101. One lecture or laboratory period per week. The theory and practice of judging and culling by physical means is emphasized, including correlation studies of characteristics associated with productivity. Contestants for regional collegiate judging competitions will be selected from this class. (Bigbee)

ANSC 262 (062). COMMERCIAL POULTRY MANAGEMENT. (3)
Second semester. Prerequisite, ANSC 101. A symposium of finance, investment, plant layout, specialization, purchase of supplies and management problems in baby chick, egg, broiler and turkey production; foremanship, advertising, selling, by-products, production and financial records. Field trips required. (Bigbee)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

ANSC 301 (120.) ADVANCED LIVESTOCK JUDGING. (2)
First semester. Two laboratory periods per week. Prerequisites, ANSC 222 and permission of instructor. An advanced course in the selection and judging of purebred and commercial meat animals. The most adept students enrolled in this course are chosen to represent the University of Maryland in Intercollegiate Livestock judging contests. (Buric)

ANSC 398 (199). SEMINAR. (1, 1)
First and second semesters. Prerequisite, permission of staff. Presentation and discussion of current literature and research work in animal science. (Staff)

ANSC 399 (198). SPECIAL PROBLEMS IN ANIMAL SCIENCE. (1-2) (4 cr. max.)
First and second semesters. Prerequisite, approval of staff. Work assigned in proportion to amount of credit. A course designed for advanced undergraduates in which specific problems relating to animal science will be assigned. (Staff)

ANSC 401 (109). FUNDAMENTALS OF NUTRITION. (3)
Second semester. Three lectures per week. Prerequisite, CHEM 104. A study of the fundamental role of all nutrients in the body, including their digestion, absorption, and metabolism. Dietary requirements and nutritional deficiency syndromes of laboratory and farm animals and man will be considered. This course will be for both graduate and undergraduate credit, with additional assignments given to the graduate students. (Staff)
signments given to the graduate students. (Thomas)

ANSC 402 (110). APPLIED ANIMAL NUTRITION. (3)
First semester. Two lectures and one laboratory period per week. Prerequisites, MATH 110, ANSC 401 or permission of instructor. A critical study of those factors which influence the nutritional requirements of ruminants, swine and poultry. Practical feeding methods and procedures used in formulation of economically efficient rations will be presented. (Vandersall)

ANSC 403 (141). APPLIED ANIMAL PHYSIOLOGY. (4)
Second semester. Three lectures and one three-hour laboratory period per week. Prerequisite, ANSC 211 or equivalent. The physiology of domesticated animals with emphasis on functions related to production, and the physiological adaption to environmental influences. (Staff)

ANSC 407 (143S). ADVANCED DAIRY PRODUCTION. (1)
Summer session only. An advanced course primarily designed for teachers of vocational agriculture and county agents. It includes a study of the newer discoveries in dairy cattle nutrition, breeding and management. (Staff)

ANSC 411 (116). ANATOMY OF DOMESTIC ANIMALS. (3)
First semester. One lecture and two laboratory periods per week. A systematic gron and microscopic comparative study of the anatomy of the domestic animal with emphasis on those systems important in animal production. Prerequisite, ZOOL 101. (Staff)

ANSC 412 (117). INTRODUCTION TO DISEASES OF ANIMALS. (3)
Second semester. Two lectures and one laboratory period per week. This course gives basic instruction in the nature of disease: including causation, immunity, methods of diagnosis, economic importance, public health aspects and prevention and control of the common diseases of sheep, cattle, swine, horses and poultry. Prerequisite, MICB 200 and ZOOL 101. (Staff)

ANSC 413 (119). LABORATORY ANIMAL MANAGEMENT. (3)
Both semesters. A comprehensive course in care and management of laboratory animals. Emphasis will be placed on physiology, anatomy and special uses for the different species. Disease prevention and regulations for maintaining animals colonies will be covered. Field trips will be required. (Marquardt)

ANSC 416 (118). WILDLIFE MANAGEMENT. (3)
Second semester. Two lectures and one laboratory. An introduction to the interrelationships of game birds and mammals with their environment, population dynamics and the principles of wildlife management. (Flyger)

ANSC 422 (121). MEATS. (3)
Second semester. Two lectures and one laboratory period per week. Prerequisite, ANSC 221. Registration limited to 14 students. A course designed to give the basic facts about meat as a food and the factors influencing acceptability, marketing, and quality of fresh meats. It includes comparisons of characteristics of live animals with their carcasses, grading and evaluating carcasses as well as wholesale cuts, and the distribution and merchandising of the nation's meat supply. Laboratory periods are conducted in packing houses, meat distribution centers, and retail outlets. (Buric)

ANSC 423 (122). LIVESTOCK MANAGEMENT. (3)
First semester. One lecture and two laboratory periods per week. Prerequisite, ANSC 401. Application of various phases of animal science to the management and production of beef cattle, sheep and swine. (Staff)

ANSC 424 (123). LIVESTOCK MANAGEMENT. (3)
Second semester. One lecture and two laboratory periods per week. Prerequisite, ANSC 423. Applications of various phases of animal science to the management and production of beef cattle, sheep and swine. (Leffel)

ANSC 426 (130). PRINCIPLES OF BREEDING. (3)
Second semester. Three lectures per week. Prerequisites, ZOOL 246 or BOTN 414. Graduate credit (1-3 hours) allowed with permission of instructor. The practical aspects of animal breeding, heredity, variation, selection, development, systems of breeding and pedigree study are considered. (Green)

ANSC 442 (142). DAIRY CATTLE BREEDING. (3)
Second semester. Two lectures and one laboratory period per week. Prerequisites, ANSC 242, ZOOL 246 or BOTN 414. A specialized course in breeding dairy cattle. Emphasis is placed on methods of evaluation and selection, systems of breeding and breeding programs. (Douglass)

ANSC 444 (146). ANALYSIS OF DAIRY PRODUCTION SYSTEMS. (3)
Prerequisites, AGEC 406 and ANSC 203 or 214, or permission of instructor. The business aspects of dairy farming including an evaluation of the costs and returns associated with each segment. The economic impact of pertinent management decisions is studied. Recent developments in animal nutrition, physiology and genetics, agricultural economics, agricultural engineering, and agronomic practices are discussed as they apply to management of a dairy herd. (Buchman)

ANSC 446 (140). PHYSIOLOGY OF MAMMALIAN REPRODUCTION. (3)
Second semester. Two lectures and one three-hour laboratory period per week. Prerequisite, ZOOL 421 or 422. Anatomy and physiology of the reproductive process and artificial insemination of cattle. (Williams)

ANSC 452 (162). AVIAN PHYSIOLOGY. (2)
Second semester. One three-hour laboratory period per week. Prerequisites, ZOOL 421 or 422 and ANSC 411. The basic physiology of the bird is discussed, excluding the reproductive system. Special emphasis is given to physiological differences between birds and other vertebrates. (Pollard)

ANSC 462 (165). PHYSIOLOGY OF HATCHABILITY. (1)
Second semester. One three-hour laboratory period per week. Prerequisite, ZOOL 421 or 422. The physiology of embryonic development as related to principles of hatchability and problems of incubation encountered in the hatchery industry are discussed. (Shaffner)

ANSC 464 (170). POULTRY HYGIENE. (3)
Second semester. Two lectures and one laboratory period per week. Prerequisites, MICB 200 and ANSC 101. Virus, bacterial and protozoon diseases, parasitic diseases, prevention, control and eradication. (Newman)

ANSC 466 (171). AVIAN ANATOMY. (3)
First semester. Two lectures and one laboratory per week. Prerequisite, ZOOL 102. Gross and microscopic structure, dissection and demonstration. (Newman)

ANSC 467 (163S). POULTRY BREEDING AND FEEDING. (1)
Summer session only. This course is designed primarily for teachers of vocational agriculture and extension service workers. The first half will be devoted to problems concerning breeding and the development of breeding stock. The second half will be devoted to nutrition. (Staff)

ANSC 477 (164S). POULTRY PRODUCTS AND MARETING. (1)
Summer session only. This course is designed primarily for teachers of vocational agriculture and county agents. It deals with the factors affecting the quality of poultry products and with hatchery managemen problems, egg and poultry grading, preservation problems and market outlets for Maryland poultry. (Helbacka)

ANSC 480 (189). SPECIAL TOPICS IN FISH AND WILDLIFE MANAGEMENT. (3)
First semester. Three lectures. Analysis of various state and federal programs related to fish and wildlife management. This would include: fish stocking programs, Maryland deer management program, warm water fish management, acid drainage problems, water quality, water fowl management, wild turkey management and regulations relative to the administration of these programs. (Staff)

ANSC 487 (131). SPECIAL TOPICS IN ANIMAL SCIENCE. (1)
Prerequisite, permission of instructor. Summer session only. This course is designed primarily for teachers of vocational agriculture and Extension Service personnel. One primary topic to be selected mutually by the instructor and students will be presented each session. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

ANSC 601 (240). ADVANCED RUMINANT NUTRITION. (2) (Staff)
ANSC 603 (265). MINERAL METABOLISM. (2) (Staff)
ANSC 604 (264). VITAMINS. (2) (Staff)
ANSC 610 (200). ELECTRON MICROSCOPY. (4) (Staff)
ANSC 622 (220). ADVANCED BREEDING. (2) (Staff)
ANSC 641 (242). EXPERIMENTAL MAMMALIAN SURGERY I. (2)
ANSC 642 (243). EXPERIMENTAL MAMMALIAN SURGERY II. (3)
ANSC 643 (241). RESEARCH METHODS. (3) (Staff)
ANSC 660 (262). POULTRY LITERATURE. (1-4) (Staff)
ANSC 661 (261). PHYSIOLOGY OF REPRODUCTION. (3) (Staff)
ANSC 663 (263). POULTRY NUTRITION LABORATORY. (2)
ANSC 665 (266). PHYSIOLOGICAL GENETICS OF DOMESTIC ANIMALS (2) (Staff)

ANSC 690 (280). SEMINAR IN POPULATION GENETICS OF DOMESTIC ANIMALS. (3) (Staff)
ANSC 698 (302). SEMINAR. (1) (Staff)
ANSC 699 (301). SPECIAL PROBLEMS IN ANIMAL SCIENCE. (1-2) (4 cr. max.) (Staff)
ANSC 799 (399). RESEARCH-MASTER'S THESIS. (1-6) (Staff)
ANSC 899 (499). RESEARCH-PH.D. DISSERTATION (1-6) (Staff)

BOTANY

Professor and Department Chairman: Krauss.
Professors: Corbett, Galloway, Gauch, Kantzes, Krusberg, D. T. Morgan, Sisler, Stern and Weaver.
Research Professor: Sorokin.
Associate Professors: Brown, Karlander, Klarman, Lockard, O. D. Morgan, Paterson and Rappleye.
Assistant Professors: Barnett, Bean, Curtis, Harrison, Motta, Reveal and Smith.
Instructors: Grigg, Higgins and Owens.

GENERAL BOTANY

BOTN 100 (001). GENERAL BOTANY. (4)
First and second semesters. Summer session. Two lectures and two laboratory periods a week. General introduction to botany, touching briefly on all phases of the subject. Emphasis is on the fundamental biological principles of the higher plants.
100 (001). (Galloway and Departmental Faculty)

BOTN 100H (001H). GENERAL BOTANY. (4)
First and second semesters. Two lectures and two laboratory periods a week. A broad study of plant science with emphasis on current conceptions of major fields of interest. Designed for general honors students, as well as for freshman students with superior training in biology or chemistry, for upper class science majors, and for those students seeking an advanced treatment of BOTN 100 (001). (Galloway and Departmental Faculty)

BIOL 101. ORGANIZATION AND INTERRELATIONSHIPS IN THE BIOLOGICAL WORLD. (3)
First and second semester. An introductory lecture course for the non-science major emphasizing the fundamental organization, processes and interdependence of living organisms and the biological effects associated with human influences on the ecosystem. (Motto)

BOTN 202 (002). GENERAL BOTANY. (4)
Second semester. Two lectures and two laboratory periods a week. Prerequisite, BOTN 100 or equivalent. A brief evolutionary study of algae, fungi, liverworts, mosses, ferns and their relatives, and the seed plants, emphasizing their structure, reproduction, habitats, and economic importance. (Staff)

BOTN 211 (010). PRINCIPLES OF CONSERVATION. (3)
First semester. Three lectures per week. A study of the principles of economical use of our natural resources including water, soil, plants, minerals, wildlife and man. (Harrison)

BOTN 389 (195). TUTORIAL READING IN BOTANY. (HONORS COURSE) (2 or 3)
Prerequisite, admission to the Department of Botany Honors Program. A review of the literature dealing with a specific research problem in preparation for original research to be accomplished in Botany 399. Papers will be assigned and discussed in frequent sessions with the instructor. (Galloway and Departmental Faculty)

BOTN 398 (199). SEMINAR. (1)
First and second semesters. Two semester hours maximum credit. Prerequisite, permission of instructor. Discussion and readings on special topics, current literature, or problems and progress in all phases of botany. Minor experimental work may be pursued if facilities and the qualifications of the students permit. For seniors only, majors and minors in botany or biological science.

BOTN 399 (196). RESEARCH PROBLEMS IN BOTANY. (HONORS COURSE) (2 or 3)
Prerequisite, BOTN 389. The candidate for Honors will pursue a research problem under the direction and close supervision of a member of the faculty. (Staff)

BOTN 401 (116). HISTORY AND PHILOSOPHY OF BOTANY. (1)
First semester. Prerequisites, 20 semester credit hours in biological sciences including BOTN 100 or equivalent. Discussion of the development and ideas and knowledge about plants, leading to a survey of contemporary work in botanical science. (Brown)

BOTN 407 (151S). TEACHING METHODS IN BOTANY. (2)
Summer session. Four two-hour laboratory demonstration periods per week, for eight weeks. Prerequisite, BOTN 100, or equivalent. A study of the biological principles of common plants, and demonstrations, projects, and visual aids suitable for teaching in primary and secondary schools. (Lockard)

BOTN 415 (136). PLANTS AND MANKIND. (2)
First semester. Prerequisite, BOTN 100 or equivalent. A survey of the plants which are utilized by man, the diversity of such utilization, and their historic and economic significance. (Rappleye)

BOTN 477 (171). MARINE PLANT BIOLOGY. (4)
Summer session. Prerequisite, BOTN 100 or General Biology plus organic chemistry or the consent of the instructor. Five one-hour lectures and three, 3-hour laboratories each week for six weeks. An introduction to the taxonomic, physiological and biochemical characteristics of marine plants which are basic to their role in the ecology of the oceans and estuaries. Laboratory fee $12.00. (Krauss and Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

BOTN 698 (302). SEMINAR IN BOTANY. (1) (Staff)
BOTN 699 (301). SPECIAL PROBLEMS IN BOTANY. (1 to 3)
A. Physiology; B. Ecology; C. Pathology; D. Mycology; E. Nematology; F. Cytology; G. Cytogenetics; H. Morphology; I. Anatomy; J. Taxonomy.
(Staff)

PLANT PHYSIOLOGY

FOR ADVANCED UNDERGRADUATES AND GRADUATES

BOTN 441 (101). PLANT PHYSIOLOGY. (4)
First semester. Two lectures and one 4-hour laboratory period a week. Prerequisites, BOTN 001 and General Chemistry. Organic chemistry strongly recommended. A survey of the general physiological activities of plants. (Patterson, Lockard)

BOTN 497 (172). SPECIAL PROBLEMS IN MARINE RESEARCH. (1-3)
Summer session. Prerequisites, BOTN 100 or general biology plus organic chemistry or consent of instructor. Recommended concurrent or previous enrollment in BOTN 477, Marine Plant Biology. An experimental approach to problems in marine research dealing primarily with the phytoplankton, the larger algae, and marine spermatophytes. Emphasis will be placed on their physiological and biochemical activities. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

BOTN 641 (230). ADVANCED PLANT PHYSIOLOGY. (2) (Patterson)
BOTN 642 (231). PLANT BIOCHEMISTRY. (2) (Galloway)
BOTN 644 (233). PLANT BIOCHEMISTRY-BIOPHYSICS LABORATORY. (4) (Staff)
BOTN 645 (204). GROWTH AND DEVELOPMENT. (2) (Barnettt)
BOTN 652 (232). PLANT BIOPHYSICS. (2) (Karlander)
BOTN 672 (209). PHYSIOLOGY OF ALGAE. (2) (Staff)
BOTN 674 (210). PHYSIOLOGY OF ALGAE—LABORATORY. (1) (Staff)

PLANT PATHOLOGY

BOTN 221 (020). DISEASES OF PLANTS. (4)
First semester. Two lectures and two laboratory periods a week. Prerequisite, BOTN 100, or equivalent. An introductory study of the symptoms and causal agents of plant diseases and measure for their control. (Klarman)

BOTN 422 (122). RESEARCH METHODS IN PLANT PATHOLOGY. (2)
Second semester. Two laboratory periods a week. Prerequisite, BOTN 221, or equivalent. Advanced training in the basic research techniques and methods of plant pathology. (Curtis)

BOTN 424 (127). DIAGNOSIS AND CONTROL OF PLANT DISEASES. (3)
Second semester. Prerequisite, BOTN 221. Three lectures per week. A study of various plant diseases grouped according to the manner in which the host plants are affected. Emphasis will be placed on recognition of symptoms of the various types of diseases and on methods of transmission and control of the pathogens involved. (Bean)

BOTN 427 (152S). FIELD PLANT PATHOLOGY. (1)
Summer session. Daily lecture for three weeks. Prerequisite, BOTN 221, or equivalent. Given in accordance with demand. A course for county agents and teachers of vocational agriculture. Discussion and denomination of the important diseases in Maryland crops. (Kantzes)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

BOTN 621 (223). PHYSIOLOGY OF FUNGI. (2) (Sisler)
BOTN 623 (224). PHYSIOLOGY OF FUNGI LABORATORY. (1) (Staff)
BOTN 625 (227). PHYSIOLOGY OF PATHOGENS AND HOST-PATHOGEN RELATIONSHIPS. (3) (Staff)
BOTN 632 (221). PLANT VIROLOGY. (2) (Corbett)
BOTN 634 (222). PLANT VIROLOGY LABORATORY. (2) (Staff)
BOTN 636 (241). PLANT NEMATOLOGY. (4) (Krusberg).

TAXONOMY

BOTN 212 (011). PLANT TAXONOMY. (3)
Second semester. One lecture and two laboratory periods a week. Prerequisite, BOTN 001, or equivalent. An introductory study of plant classification, based on the collection and identification of local plants. (Brown)

BOTN 405 (161). SYSTEMATIC BOTANY. (3)
Fall semester. (Not offered 1972-73). Two two-hour laboratory periods a week. Prerequisite, BOTN 212 or equivalent. An advanced study of the principles of systematic botany. Laboratory practice with difficult plant families including grasses, sedges, legumes, and composites. Field trips arranged. (Reveal)

BOTN 417 (153S). FIELD BOTANY AND TAXONOMY. (2)
Summer session. Prerequisite, BOTN 100 or General Biology. Four two-hour laboratory periods a week for eight weeks. The identification of trees, shrubs, and herbs, emphasizing the native plants of Maryland. Manuals, keys, and other techniques will be used. Numerous short field trips will be taken. Each student will make an individual collection. (Brown)

BOTN 426 (128). MYCOLOGY. (4)
Second semester. An introductory study of the morphology, classification, life histories, and economics of the fungi. (Motta)

ECOLOGY

BOTN 413 (113). PLANT GEOGRAPHY. (2)
First semester. Prerequisite, BOTN 100, or equivalent. A study of plant distribution throughout the world and the factors generally associated with such distribution. (Brown)

BOTN 462 (102). PLANT ECOLOGY. (2)
Second semester. Prerequisite, BOTN 100. Two lectures per week. The dynamics of populations as affected by environmental factors with special emphasis on the structure and composition of natural plant communities, both terrestial and equatic. (Staff)

BOTN 464 (103). PLANT ECOLOGY LABORATORY. (1)
Prerequisite, BOTN 462 or its equivalent or concurrent enrollment therein. One three-hour laboratory period a week. The application of field and experimental methods to the qualitative and quantitative study of vegetation in environmental factors. (staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

BOTN 661 (219). ADVANCED PLANT ECOLOGY. (3) (Staff)

ANATOMY—MORPHOLOGY

BOTN 302 (110). PLANT MICROTECHNIQUE. (3)
Second semester. One lecture a week. Laboratory periods by arrangement. Prerequisite, BOTN 100 or equivalent and permission of instructor. Preparation of temporary and permanent mounts, including selection of material, killing and fixing, embedding, sectioning, and staining methods; photomicrography, film and paper processing and preparation of photographic illustrations for research publication. (Stern)

BOTN 411 (111). PLANT ANATOMY. (3)
First semester. One lecture and two laboratory periods a week. The origin and development of the organs and tissue systems in the vascular plants. (Stern)

BOTN 412 (115). STRUCTURE OF ECONOMIC PLANTS. (3)
Second semester. One lecture and two laboratory periods a week. Prerequisite, BOTN 411. A detailed microscopic study of the anatomy of the chief fruit and vegetable crops. (Rappleye)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

BOTN 612 (212). PLANT MORPHOLOGY. (3)

GENETICS

BOTN 414 (117). GENERAL PLANT GENETICS. (3)
Second semester. Prerequisite, BOTN 100 or equivalent. The basic principles of plant genetics are presented; the mechanics of transmission of the hereditary factors in relation to the life cycle of seed plants, the genetics of specialized organs and tissues, spontaneous and induced mutations of basic and economic significance, gene action, genetic maps, the fundamentals of polyploidy, and genetics in relation to methods of plant breeding are the topics considered. (Smith)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

BOTN 615 (215). PLANT CYTOGENETICS. (3) (D. T. Morgan)
BOTN 616 (216). NUCLEIC ACIDS AND MOLECULAR GENETICS. (2) (Smith)
BOTN 799 (399). M. S. RESEARCH. (Cr Arr) (Staff)
BOTN 899 (499). PH.D. RESARCH. (Cr Arr) (Staff)

ENTOMOLOGY

Professor and Department Chairman: Bay.
Professors: Bickley, Jones.
Associate Professors: Harrison, Menzer, Messersmith and Steinhauer.
Assistant Professors: Caron, Davidson and Reichelderfer
Lecturers: Heimpel and Spangler.

ENTM 100 (005). INSECTS. (3)
First and second semesters. A survey of the major groups of insects, their natural history, and their relationships with man and his environment. (Messersmith and Staff)

ENTM 111 (004). BEEKEEPING. (2)
First semester. A study of the life history, behavior and seasonal activities of the honeybee, its place in pollination of flowers with emphasis on plants of economic importance and bee lore in literature. (Caron)

ENTM 200 (015). INTRODUCTORY ENTOMOLOGY. (3)
First semester. Two lectures and one two-hour laboratory period a week. Prerequisite, one semester of college zoology. The position of insects in the animal kingdom, their gross structure, classification into orders and principal families and the general economic status of insects. A collection of common insects is required. (Messersmith)

ENTM 252 (020). AGRICULTURAL INSECT PESTS. (3)
Second semester. 2 lectures and one 2-hour laboratory period a week. Prerequisite, BOTN 100 or ZOOL 101. An introduction to the principal insect pests of fruit, vegetable, forage, and ornamental crops, with special reference to Maryland agriculture. Not open to entomology majors. (Harrison)

ENTM 399 (198). SPECIAL PROBLEMS. (1-3)
First and second semesters. Credit and prerequisites to be determined by the department. Investigations of assigned entomological problems. (Staff)

ENTM 407 (121S). ENTOMOLOGY FOR SCIENCE TEACHERS. (4)
Summer. Four lectures and four three-hour laboratory periods a week. This course will include the elements of morphology, taxonomy and biology of insects using examples commonly available to high school teachers. It will include practice in collecting, preserving, rearing and experimenting with insects insofar as time will permit. (Davidson or Messersmith)

ENTM 412 (100). ADVANCED APICULTURE. (3)
Second semester. One lecture and two three-hour laboratory periods a week. Prerequisite, ENTM 111. The theory and practice of apiary management. Designed for the student who wishes to keep bees or requires a practical knowledge of bee management. (Caron)

ENTM 421 (120). INSECT TAXONOMY AND BIOLOGY. (4)
First semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, ENTM 200. Introduction to the principles of systematic entomology and the study of all orders and the important families of insects; immature forms considered. (Davidson)

ENTM 432 (122). INSECT MORPHOLOGY. (4)
Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisite, ENTM 200. A basic study of insect form, structure and organization in relation to function. (Davidson)

ENTM 442 (123). INSECT PHYSIOLOGY. (4)
Second semester. Two lectures and two three-hour laboratory periods a week. Prerequisites, ENTM 200, CHEM 237 or equivalent. Lectures and laboratory exercises on the cuticle, growth, endocrines, muscles, circulation, nerves, digestion, excretion and reproduction in insects. (Jones)

ENTM 451 (124). ECONOMIC ENTOMOLOGY. (4)
First semester. 2 lectures and two 2-hour laboratory periods a week. Prerequisite, ENTM 200. The recognition, biology and control of insects injurious to fruit and vegetable crops, field crops and stored products. (Harrison)

ENTM 452 (107). INSECTICIDES. (2)
Second semester. Prerequisite, consent of the department. The development and use of contact and stomach poisons, fumigants and other important chemicals, with reference to their chemistry, toxic action, compatability, and host injury. Recent research emphasized. (Menzer)

ENTM 462 (125). INSECT PATHOLOGY. (3)
Second semester. 2 lectures and one 3-hour laboratory period per week. Prerequisite, MICB 200, prerequisite or concurrent ENTM 442, or consent of the instructor. An introduction to the principal insect pathogens with special reference to symptomology, epizootiology, and microbial control of insect pests. (Reichelderfer)

ENTM 472 (105). MEDICAL AND VETERINARY ENTOMOLOGY. (4)
Second semester. Three lectures and one two-hour laboratory period a week. Prerequisite, ENTM 200 or consent of the department. A study of the morphology, taxonomy, biology and control of the arthropod parasites and disease vectors of man and animals. The ecology and behavior of vectors in relation to disease transmission will be emphasized. (Mesersmith)

ENTM 498 (199). SEMINAR. (1, 1)
First and second semesters. Prerequisite, senior standing. Presentation of original work, reviews and abstracts of literature. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

ENTM 612 (205). INSECT ECOLOGY. (2) (Harrison)
ENTM 641 (209). ADVANCES IN INSECT PHYSIOLOGY. (2) (Jones)
ENTM 643 (211). ASPECTS OF INSECT BIOCHEMISTRY. (2) (Menzer)
ENTM 653 (208). TOXICOLOGY OF INSECTICIDES. (4) (Menzer)
ENTM 672 (206). CULICIDOLOGY. (2) (Bickley)
ENTM 689 (210). ENTOMOLOGICAL TOPICS. (Cr Arr) (Staff)
ENTM 699 (301). ADVANCED ENTOMOLOGY. (1-6)
ENTM 799 (399). THESIS RESEARCH. (Master's Level) (Cr Arr) (Staff)
ENTM 899 (499). DISSERTATION RESEARCH. (Doctoral Level) (Cr Arr) (Staff)

FOOD SCIENCE

Professor and Chairman: Stark (Horticulture).
Professors: Young (Animal Science), Davis, Arbuckle, King and Mattick (Dairy Science); Kramer, Scott, Twigg and Wiley (Horticulture); Shaffner (Poultry Science).
Associate Professors: Buric (Animal Science); Bigbee (Poultry Science).
Assistant Professors: Westhoff (Dairy Science); Heath (Poultry Science).

FDSC 111 (001). INTRODUCTION TO FOOD SCIENCE. (3)
Second semester. Two lectures and one laboratory per week. An introductory course to orient the student in the broad field of food science. Includes a historical and economic survey of the major food industries, composition and nutritive value, quality aspects, spoilage, preservation, sanitation, standards and regulation of foods. (Mattick)

FDSC 398 (199). SEMINAR. (1)
Second semester. Presentation and discussion of current literature and research in food science. (Staff)

FDSC 399 (198). SPECIAL PROBLEMS IN FOOD SCIENCE. (1-3) (4 cr. max.)
First and second semesters. Prerequisite, approval of staff. Designed for advanced undergraduates in which specific problems in food science will be assigned. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

FDSC 412 (102). PRINCIPLES OF FOOD PROCESSING I. (3)
Second semester. Two lectures and one laboratory per week. A study of the basic methods by which foods are preserved (unit operations). Effect of raw product quality and the various types of processes on yield and quality of the preserved products. (Wiley)

FDSC 413 (103). PRINCIPLES OF FOOD PROCESSING II. (3)
First semester. Three lectures per week. A detailed study of food processing with emphasis on line and staff operations, including physical facilities, utilities,

pre- and post-processing operations, processing line development and sanitation. (Mattick)

FDSC 421 (111). FOOD CHEMISTRY. (3)
First semester. Two lectures and one laboratory per week. Prerequisite, CHEM 201, 202. The application of basic chemical and physical concepts to the composition and properties of foods. Emphasis will be on the relationship of processing technology to the keeping quality, nutritional value and acceptability of foods. (King)

FDSC 422 (131). FOOD PRODUCT RESEARCH AND DEVELOPMENT. (3)
Second semester. Two lectures, one laboratory per week. Prerequisites, FDSC 413, CHEM 461, or permission of instructor. A study of the research and development function for improvement of existing products and development of new, economically feasible and marketable food products. Application of chemical-physical characteristics of ingredients to produce optimum quality products, cost reduction, consumer evaluation, equipment and package development. (Mattick)

FDSC 430 (NEW). FOOD MICROBIOLOGY. (3)
Second semester. Two lectures and one laboratory per week. Microorganisms of major importance to the food industry are studied with emphasis on their isolation, identification, bio-processing of foods, and public health significance. The presence of these organisms in foods is examined considering ecological and physiological factors. (Westhoff)

FDSC 431 (113). STATISTICAL QUALITY CONTROL. (3)
First semester. Two lectures and one laboratory per week. Prerequisite, AGRI 401. Statistical methods for acceptance, sampling of supplies and raw materials, in-plant and finished product inspection, water, fuel, and waste control, production, transportation, inventory and budget controls. (Kramer)

FDSC 432 (112). ANALYTICAL QUALITY CONTROL. (3)
Second semester. Two lectures and one laboratory per week. Prerequisite, CHEM 201, 202. Instrumental and sensory measurement of food quality attributes including appearance, rheological, flavor, and microbiological evaluations, and their integration into grades and standards of quality. (Kramer)

FDSC 442 (156). HORTICULTURAL PRODUCTS PROCESSING. (3)
Second semester, alternate years. Two lectures and one laboratory per week. Commercial methods of canning, freezing, dehydrating, fermenting, and chemical preservation of fruit and vegetable crops. (Wiley)

FDSC 451 (182). DAIRY PRODUCTS PROCESSING. (3)
First semester, alternate years. Two lectures and one laboratory per week. Method of production of fluid milk, butter, cheese, condensed and evaporated milk and milk products and ice cream. (Mattick)

FDSC 461 (160). TECHNOLOGY OF MARKET EGGS AND POULTRY. (3)
First semester, alternate years. Two lectures and one laboratory per week. A study of the technological factors concerned with the processing, storage, and marketing of eggs and poultry and the factors affecting their quality. (Heath)

FDSC 471 (125). MEAT AND MEAT PROCESSING. (3)
First semester, alternate years. Two lectures and one laboratory per week. Prerequisite, CHEM 461 or permission of instructor. Physical and chemical characteristics of meat and meat products, meat processing, methods of testing and product development. (Sulzbacher)

FDSC 482 (175). SEAFOOD PRODUCTS PROCESSING. (3)
Second semester, alernate years. Two lectures and one laboratory a week. Prerequisite, CHEM 461 or permission of instructor. The principal preservation methods for comercial seafood products with particular reference to the invertebrates. Chemical and microbiological aspects of processing are emphasized.

Mechanics of Food Processing, see Agricultural Engineering, AGEN 313.

Experimental Food Science, see Food and Nutrition, FOOD 450.

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

FDSC 689 (302). SEMINAR IN FOOD SCIENCE. (1-3) (Staff)

FDSC 698 (310). COLLOQUIUM IN FOOD SCIENCE. (1) (Staff)

FDSC 699 (301). SPECIAL PROBLEMS IN FOOD SCIENCE. (1-4) (Staff)

FDSC 799 (399). THESIS RESEARCH. (Cr Arr) (Staff)

FDSC 811 (201). ADVANCES IN FOOD TECHNOLOGY. (3) (Kramer)

FDSC 899 (499). DISSERTATION RESEARCH. (Cr Arr) (Staff)

Methods of Horticultural Research, see Horticulture, HORT 682.

Research Methods, see Animal Science, ANSC 643.

Recent Progress in Human Nutrition, see Home Economics, NUTR 600.

GEOLOGY

Associate Professors: Fernow, Segovia, Siegrist and Stifel.

Assistant Professors: Maccini and Weidner.

GEOL 100 (001). INTRODUCTORY PHYSICAL GEOLOGY. (3)
First and second semester. A study dealing primarily with the principles of dynamical and structural geology. Designed to give a general survey of the rocks and minerals composing the earth; the movement within it; and its surface features and the agents that form them. (Staff)

GEOL 102 (002). HISTORICAL AND STRATIGRAPHIC GEOLOGY. (3)
Second semester, Prerequisite, GEOL 100. A study of the earth's history as revealed through the principles of stratigraphy and the processes of physical geology, with emphasis on the formations and the geologic development of the North American continent. (Stifel)

GEOL 110 (004). PHYSICAL GEOLOGY LABORATORY. (1)
First and second semester. One laboratory a week. May be taken concurrently with or after successful completion of GEOL 100. The basic materials and tools of physical geology stressing familiarization with rocks and minerals and the use of maps in geologic interpretations. (Staff)

GEOL 112 (005). HISTORICAL GEOLOGY LABORATORY. (1)
Second semester. One laboratory a week. Concurrent registration in GEOL 102 or consent of instructor is required. The use of geologic maps and fossils in the study of the physical and biological evolution of the earth. (Stifel)

GEOL 399 (194). RESEARCH PROBLEMS IN GEOLOGY. (1)
First and second semester. Open only to geology majors in their final year. The student will select and investigate with departmental assistance a specific library, laboratory or field study. A written and oral presentation of the study will determine satisfactory completion of the course. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

GEOL 421 (120). CRYSTALLOGRAPHY. (3)
First semester. Two lectures and one laboratory a week. Prerequisite, MATH 115 or consent of instructor. An introduction to the study of crystals. Stresses the theoretical and practical relationships between the internal and external properties of crystalline solids. Encompasses morphological, optical and chemical crystallography. (Siegrist)

GEOL 422 (121). MINERALOGY. (3)
Second semester. One lecture and two laboratories a week. Prerequisite, GEOL 110 and 421 or consent of instructor. Basic elementary mineralogy with emphasis on description, identification, formation, concurrence and economic significance of approximately 150 minerals. (Siegrist)

GEOL 423 (122). OPTICAL MINERALOGY. (3)
First semester, alternate years. (Offered 1972-73) One lecture and two laboratories a week. Prerequisite, GEOL 422 or consent of instructor. The optical behavior of crystals with emphasis on the theory and application of the petrographic microscope. (Weidner)

GEOL 431 (130). INVERTEBRATE PALEONTOLOGY. (3)
First semester. Two lectures and one laboratory a week. Prerequisite, GEOL 102 or consent of instructor. ZOOL 102 or equivalent recommended. A systematic review of the morphology, classification, ecology, and geologic ranges of selected invertebrate groups represented in the fossil record. (Fernow)

GEOL 432 (131). STRATIGRAPHIC PALEONTOLOGY. (3)
Second semester, alternate years. (Offered 1971-72) Two lectures and one laboratory a week. Prerequisite, GEOL 431. Principles of biostratigraphy, paleoecology and paleogeography. Laboratory study emphasizes significant index fossils. (Fernow)

GEOL 434 (134). MICROPALEONTOLOGY. (3)
Second semester, alternate years. (Offered 1972-73) Two lectures and one laboratory a week. Prerequisite, GEOL 431 or consent of instructor. A systematic review of the morphology, classification, ecology and geologic ranges of important microfossil groups, particularly ostracodes and foraminifera. (Stifel)

GEOL 441 (140). STRUCTURAL GEOLOGY. (3)
First semester. Two lectures and one laboratory a week. Prerequisite, GEOL 110 or consent of instructor. A study of the cause and nature of the physical stresses and resulting deformational responses in the earth. Laboratory exercises include crustal model studies and stereographic analysis of deformational structures. (Segovia)

GEOL 442 (141). SEDIMENTATION. (3)
Second semester, alternate years. (Offered 1972-73) Two lectures and one laboratory a week. Prerequisite, GEOL 110 or consent of instructor. A study of the critical variables in sedimentation systems; origin, dispersion, accumulation, and properties of sediments and sedimentary rocks. Laboratories will include the measurement and statistical analysis of sediment properties and study of sedimentation rates. (Stifel)

GEOL 443 (142). IGNEOUS AND METAMORPHIC PETROLOGY. (2)
Second semester, alternate years. (Offered 1971-72) Two laboratories a week. Prerequisite, GEOL 422 or consent of instructor. A detailed study of igneous and metamorphic rocks: petrogenesis; distributions; chemical and mineralogical relations; macroscopic descriptions and geologic significance. (Weidner)

GEOL 444 (143). PETROGRAPHY. (2)
Second semester, alternate years. (Offered 1972-73) Two laboratories a week. Prerequisites, GEOL 423, 442, 443 or consent of instructor. Microscopic thin-section studies of rocks stressing the description and classification of igneous, metamorphic and sedimentary rocks. (Weidner)

GEOL 445 (145). PRINCIPLES OF GEOCHEMISTRY. (3)
Three lectures per week. Prerequisite, CHEM 103 or equivalent and senior standing. A survey of historical and modern theories of the origin of elements and their distributions in space, on extra-terrestrial bodies and on Earth. Discussion of the origin of igneous rocks, of the physical and chemical factors governing development and distribution of sedimentary rocks of the oceans and of the atmosphere. Organic sediments, the internal structures of Earth and the planets, the role of isotopes in geothermometry and in the solution of other problems.

GEOL 446 (147). GEOPHYSICS. (3)
Second semester, alternate years. (Offered 1972-73) Two lectures and one laboratory a week. Prerequisite, PHYS 122 or consent of instructor. An introduction to the basic theories and principles of geophysics stressing such important applications as rock magnetism, gravity anomolies, crustal strain and earthquakes, and surveying. (Staff)

GEOL 451 (150). GROUNDWATER GEOLOGY. (3)
First semester, alternate years. (Offered 1972-73) Prerequisite, GEOL 100 or consent of instructor. An introduction to the basic geologic parameters associated with the hydrologic cycle. Problems in the accumulation, distribution and movement of groundwater will be analyzed. (Staff)

GEOL 452 (151). MARINE GEOLOGY. (3)
Second semester, alternate years. (Offered 1972-73) Prerequisite, GEOL 100 or consent of instructor. An introduction to the essential elements of marine and estuarine geology including studies of currents, tides, waves, coastline development, shore erosion and marine and bay sedimentation. (Staff)

GEOL 453 (152). ECONOMIC GEOLOGY I—METALLIC ORE DEPOSITS. (2)
First semester, alternate years. (Offered 1972-73) Two laboratories a week. Prerequisite, GEOL 422 or consent of instructor. A study of the geology of metallic ore deposits stressing ore-forming processes, configuration of important ore bodies, and familiarization with characteristic ore mineral suites. (Staff)

GEOL 454 (153). ECONOMIC GEOLOGY II—NON-METALLIC ORE DEPOSITS. (2)
Second semester, alternate years. (Offered 1972-73) Two laboratories a week. Prerequisite, GEOL 422 or consent of instructor. A study of the geology of non-metallic ore deposits: nitrates, phosphates, limestone, etc., and fossil fuels; coal oil, and natural gas. (Staff)

GEOL 456 (154). ENGINEERING GEOLOGY. (3)
Second semester, alternate years. (Offered 1971-72) Two lectures and one laboratory a week. Prerequisite, GEOL 110 or consent of instructor. A study of the geological problems associated with the location of tunnels, bridges, dams and nuclear reactors, slope control, and natural hazards. (Segovia)

GEOL 460 (160). EARTH SCIENCE. (3)
First semester. Two lectures and one laboratory a week. Prerequisite, permission of instructor. An interdisciplinary course designed to show how geology, meteorology, physical geography, soil science, astronomy and oceanography are interrelated in the study of the earth and its environment in space. Recommended for science education undergraduates and graduate students. May not be used for credit towards geology majors. (Maccini)

GEOL 462 (162). GEOLOGICAL REMOTE SENSING. (3)
Second semester, alternate years. (Offered 1972-73) One lecture and two laboratories a week. Prerequisites, GEOL 441 and GEOL 442, or GEOG 440, or consent of the instructor. An introduction to geological remote sensing including applications of aerial photographic interpretation to problems in regional geology, engineering geology, structural geology, and stratigraphy. Films, filters, and criteria used in selecting imagery are also discussed. Laboratory exercises include measurements of geologic parameters and compilation and transference of data to base maps. (Segovia)

GEOL 489 (197). SPECIAL TOPICS IN EARTH SCIENCE. (1-3)
Second semester. Prerequisite, GEOL 460 or equivalent. (Maccini)

GEOL 499 (198). SPECIAL PROBLEMS IN GEOLOGY. (1-3)
First and second semesters. Prerequisites, GEOL 102 and GEOL 110 or equivalent, and consent of instructor. Intensive study of a special geologic subject or technique selected after consultation with instructor. Intend-

ed to provide training or instruction not available in other courses which will aid the student's development in his field of major interest. (Staff)

HORTICULTURE

Professor and Department Chairman: Stark.
Professors: Haut, Kramer, Ling, Reynolds, Scott, Shanks, Thompson and Wiley.
Associate Professors: Angell and Soergel.
Assistant Professors: Baker and Bouwkamp.
Lecturers: Borthwick, Hendee, Hornstein and Howell.
Visiting Lecturer: Koch.

HORT 111 (005). TREE FRUIT PRODUCTION. (3)
First semester. Prerequisite, BOTN 100. Two lectures and one laboratory per week. A detailed study of the principles and practices in fruit production, harvesting and storage, with emphasis on the apple. One field trip required. (Thompson)

HORT 112 (006). TREE FRUIT PRODUCTION. (2)
Second semester, alternate years. Two lectures per week. Prerequisite, HORT 111. A study of the principles and practices in fruit production, harvesting, and handling of deciduous tree fruit crops other than the apple. (Thompson)

HORT 132 (016). GARDEN MANAGEMENT. (2)
Second semester. Two lectures per week. Prerequisite, BOTN 100. The planting and care of ornamental plants on the home grounds and a study of commonly used species of annuals and herbaceous perennials. (Baker)

HORT 142 (017). GARDEN MANAGEMENT LABORATORY. (1)
Second semester. One two-hour laboratory per week. Prerequisite or concurrent HORT 132. Demonstration and application of practices in the production and maintenance of garden plants. (Baker)

HORT 160 (020). INTRODUCTION TO THE ART OF LANDSCAPING. (3)
First and second semesters. Three lectures per week. The theory and general principles of landscaping design with their application to public and private areas. (Soergel)

HORT 171 (030). ELEMENTS OF FORESTRY. (3)
First semester. Two lectures per week. Prerequisite, BOTN 100. A general survey of the field of forestry, including timber values, conservation, protection silviculture, utilization, mensuration, engineering, recreation and lumbering. Principles and practices of woodland management. Four all-day Saturday field trips are required. (Hendee)

HORT 212 (059). BERRY PRODUCTION. (3)
Second semester. Two lectures and one laboratory period a week. Prerequisite, BOTN 100. A study of the principles and practices involved in the production of small fruits including grapes, strawberries, raspberries, blackberries, and cranberries. (Angell)

HORT 222 (058). VEGETABLE PRODUCTION. (3)
Second semester. Two lectures and one laboratory period a week. Prerequisite, BOTN 100. A study of principles and practices of commercial vegetable production. (Reynolds)

HORT 231 (011). GREENHOUSE MANAGEMENT. (3)
First semester. Three lectures per week. Prerequisite, BOTN 100. A study of the construction and operation of structures for forcing horticultural crops and the principles underlying the regulation of plant growth under greenhouse conditions. (Shanks)

HORT 232 (063). FLOWER STORE MANAGEMENT. (3)
Second semester, alternate years. Two lectures and one laboratory period a week. Prerequisite, HORT 231. A study of the operation and management of a flower store. Laboratory period devoted to principles and practice of floral arrangements and decoration. (Link)

HORT 241, 242 (012, 013). GREENHOUSE CROP PRODUCTION LABORATORY. (1, 1)
First and second semesters. One laboratory per week. Prerequisite or concurrent HORT 231. Demonstration an application of practices in the commercial produtions of greenhouse crops. (Shanks)

HORT 260 (056). BASIC LANDSCAPE COMPOSITION. (2)
First and second semesters. Two laboratory periods per week. The introduction of landscaping presentation technique, supplemented by problems in basic composition. (Soergel)

HORT 271 (062). PLANT PROPAGATION. (3)
First semester. Three lectures per week. Prerequisite, BOTN 100. A study of the principles and practices of the propagation of plants. (Baker)

HORT 274 (035). GENETICS OF CULTIVATED PLANTS. (3)
Second semester. Three lectures per week. Prerequisite, BOTN 100. Principles of plant genetics in relation to plant breeding. Some of the topics presented are meiosis, simple Mendelian genetics, gene interaction, linkage and crossing over, cytoplasmic and quantitative inheritance, mutations, and the role of DNA. (Bouwkamp)

FOR ADVANCED UNDERGRADUATES

HORT 361 (100). PRINCIPLES OF LANDSCAPE DESIGN. (3)
First semester. One lecture and two laboratory periods per week. Prerequisite, HORT 160 and HORT 260. A consideration of design criteria and procedure as applied to residential properties. (Soergel)

HORT 362 (152). ADVANCED LANDSCAPE DESIGN. (3)
Second semester, alternate years. One lecture and two laboratory periods per week. Prerequisite, HORT 361, prerequisite or concurrent HORT 454. The design of public and private areas with the major emphasis on plant materials. (Soergel)

HORT 364 (153). LANDSCAPE CONSTRUCTION. (3)
Second semester, alternate years. One lecture and two laboratory periods per week. Prerequisite, HORT 361. An introductory study and application of location methods, construction details, and construction techniques of the various landscape objects such as walks, walls, benches, roads. (Soergel)

HORT 398 (199). SEMINAR. (1)
Second semester. Oral presentation of the results of investigational work by reviewing recent scientific literature in the various phases of horticulture. (Stark)

HORT 399 (198). SPECIAL PROBLEMS. (2) (4 cr. max.)
See the *Graduate School catalog* for descriptions.
First and second semesters. Credit arranged according to work done. For major students in horticulture or botany. Four credits maximum per student. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

HORT 411 (101). TECHNOLOGY OF FRUITS. (3)
First semester. Three lectures per week. Prerequisite, HORT 112, prerequisite or concurrent BOTN 441. A critical analysis of research work and application of the principles of plant physiology, chemistry, and botany to practical problems in commercial production. (Thompson)

HORT 417 (124S). TREE AND SMALL FRUIT MANAGEMENT. (1)
Summer session only. Primarily designed for vocational agriculture teachers and extension agents. Special emphasis will be placed upon new and improved commercial methods of production of the leading tree and small fruit crops. Current problems and their solution will receive special attention.

HORT 422 (103). TECHNOLOGY OF VEGETABLES. (3)
Second semester. Three lectures per week. Prerequisite, HORT 222, prerequisite or concurrent BOTN 441. A critical analysis of research work and application of the

principles of plant physiology, chemistry, and botany to practical problems of commercial vegetable production. (Reynolds)

HORT 427 (115S). TRUCK CROP MANAGEMENT. (1)
Summer session only. Primarily designed for teachers of vocational agriculture and extension agents. Special emphasis will be placed upon new and improved methods of production of the leading truck crops. Current problems and their solutions will receive special attention.

HORT 432 (162). FUNDAMENTALS OF GREENHOUSE CROP PRODUCTION. (3)
Second semester, alternate years. Three lectures per week. Prerequisite, HORT 231. This course deals with a study of the commercial production and marketing of ornamental plant crops under greenhouse, plastic houses and out-of-door conditions. (Shanks)

HORT 451 (105). TECHNOLOGY OF ORNAMENTALS. (3)
First semester. Three lectures per week. Prerequisite or concurrent BOTN 441. A study of the physiological processes of the plant as related to the growth, flowering and storage of ornamental plants. (Link)

HORT 453, 454 (107, 108). WOODY PLANT MATERIALS. (3, 3)
First and second semesters. Prerequisite, BOTN 212. A field and laboratory study of trees, shrubs, and vines used in ornamental plantings. (Baker)

HORT 456 (163). PRODUCTION AND MAINTENANCE OF WOODY PLANTS. (3)
Second semester, alternate years. Two lectures and one laboratory period a week. Prerequisite or concurrent HORT 271, 454. A study of the production methods and operation of a commercial nursery and the planting and care of woody plants in the landscape. (Link)

HORT 457 (125S). ORNAMENTAL HORTICULTURE. (1)
Summer session only. A course designed for teachers of agriculture and extension agents to place special emphasis on problems of the culture and use of ornamental plants.

HORT 471 (114). SYSTEMATIC HORTICULTURE. (3)
First semester. Two lectures and one laboratory period a week. A study of the origin, taxonomic relationship and horticultural classification of fruits and vegetables.

HORT 474 (161). PHYSIOLOGY OF MATURATION AND STORAGE OF HORTICULTURAL CROPS. (2)
Second semester, alternate years. Two lectures a week. Prerequisite, BOTN 441. Factors related to maturation and application of scientific principles to handling and storage of horticultural crops. (Scott)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

HORT 682 (207). METHODS OF HORTICULTURAL RESEARCH. (3) (Scott)

HORT 689 (301). SPECIAL TOPICS IN HORTICULTURE. (1-3) (Staff)

HORT 699 (301). SPECIAL PROBLEMS IN HORTICULTURE. (1-3) (Staff)

HORT 781 (211). EDAPHIC FACTORS AND HORTICULTURAL PLANTS. (3) (Reynolds)

HORT 782 (212). CHEMICAL REGULATION OF GROWTH OF HORTICULTURAL PLANTS. (3) (Shanks)

HORT 783 (213). ENVIRONMENTAL FACTORS AND HORTICULTURAL PLANTS. (3) (Thompson)

HORT 784 (214). CURRENT ADVANCES IN PLANT BREEDING. (3) (Angell)

HORT 798 (302). ADVANCED SEMINAR. (1, 1) (Staff)

HORT 799 (399). THESIS RESEARCH. (Cr Arr) (Staff)

HORT 899 (499). DISSERTATION RESEARCH. (1-12) (Staff)

THE AGRICULTURAL EXPERIMENT STATION

Irvin C. Haut, Director

The Agricultural Experiment Station serves Maryland agriculture in much the same manner as research laboratories serve large corporations. The problems which face a biological and business undertaking such as agriculture are as numerous and perplexing as the problems of any business.

The station is a joint Federal and State undertaking. Passage of the Hatch Act of 1887, which made available a grant-in-aid to each state for the purpose of establishing an agricultural experiment station, gave a great impetus to the development of research work in agriculture. This work was further encouraged by the passage of the Adams Act in 1906, the Purnell Act in 1925, the Bankhead-Jones Act in 1935, and the Flannagan-Hope Act of 1946.

The work of the Maryland Agricultural Experiment Station, which is supported by these Acts and by State appropriations, centers at College Park. On the University campus are laboratories for studying insects and diseases, soil fertility, botanical problems, and the economics of our agricultural industry and its interrelationship with our total economy. This is also the location of the livestock and dairy barns with their experimental herds.

About eight miles from the campus at College Park, near Beltsville, the Plant Research Farm of about 500 acres is devoted to work connected with soil fertility, plant breeding and general crop production problems. An experimental farm near Upper Marlboro is devoted to the problems of tobacco growing and curing. A farm near Salisbury is devoted to solution of the problems of producers of broilers and of vegetable crops in the southern Eastern Shore area. Two experimental farms are operated near Ellicott City; one is devoted to livestock problems and the other to dairy cattle nutrition and forage research. Also tests of various crop and soil responses are distributed throughout the state. These different locations provide the opportunity to conduct experiments under conditions existing where the results will be put into practice.

COOPERATIVE EXTENSION SERVICE

Robert E. Wagner, Director

Cooperative Extension work, established by state and federal laws in 1914, extends practical information beyond the classrooms of the University of Maryland to young people and adults—both rural and urban—throughout the State of Maryland. Major program areas include agriculture and environment, family living, youth development, and community development.

The educational endeavors of the Cooperative Extension Service are financed jointly by federal, state and county governments. In each county and in Baltimore City there is a competent staff of extension agents assigned to conduct educational work in program areas consistent with the needs of the people of the county and as funds permit.

The county staff is supported by a staff of specialists located at the University, and through their mutual efforts they assist local people in seeking solutions to their problems.

The Cooperative Extension Service works in close harmony and association with many groups and organizations. In addition to work on farms and with agri-businesses, extension programs are aimed at many rural non-farm and urban family consumers. Thousands of boys and girls gain leadership knowledge and experience and are provided practical educational instruction in 4-H clubs and other youth groups.

To accomplish its mission, the Cooperative Extension Service works closely with other agricultural divisions of the University and units of the University outside of agriculture, as well as state and federal agencies and private groups. It arranges and conducts thousands of short courses, workshops and conferences in various fields of interest held both on the College Park campus and at other locations throughout the state. A wide variety of publications and radio and television are used extensively to reach the people of Maryland.

STATE BOARD OF AGRICULTURE PROGRAMS

Charles P. Ellington, Director

The State law provides that the Board of Regents of the University of Maryland shall constitute the Maryland State Board of Agriculture. While these programs are part of the University, they are designed primarily to carry out the functions of the State Board of Agriculture. Numerous services are performed which result in the improvement and maintenance of high standards in production, processing and distribution of farm products. In addition, many control or regulatory activities are authorized by state law and are carried out by the following departments of the State Board of Agriculture:

Dairy Inspection

Duties of the dairy inspection force deal with the calibration of glassware used in testing milk and cream; examination of all weighers, samplers, and testers and the issuance of licenses to those satisfactorily passing the examination; and inspection of the pertinent activities of weighers, samplers, testers, and dairy plants.

Department of Markets

Activities of the Department of Markets serve to insure a fair and equitable treatment of the farmer in all dealings which he may have concerning the marketing of his products. In the performance of these responsibilities, the department conducts market surveys, compiles and disseminates marketing information and market data, operates a market news service, provides an agricultural inspection and grading service, maintains a consumer information service, and enforces the agricultural marketing laws of the state. The control work of the department is carried out under the authority of various state laws relating to the marketing of farm products.

Field offices are located in Baltimore, Salisbury, Hancock, and Pocomoke.

State Horticultural Department

Work in this field is designed to control insects and plant diseases and to protect the public in the purchase of products of nurserymen and florists. A considerable part of staff time is occupied by inspection of orchards, crops, nurseries, greenhouses, and floral establishments. Cooperation with the federal government in the inspection and certification of materials that come under quarantine regulations is another major function of the department. The department enforces the provisions of the Apiary Law, including inspection of apiaries. It also regulates the use of pesticides under provisions of a new law enacted in 1969.

State Department of Drainage

The State Department of Drainage was established in 1937. Its duties are to encourage and assist with the drainage of agricultural lands in the state, to correlate the activities of the local drainage organizations in Maryland, and to cooperate with state and federal agencies in the interest of a permanent program of improved drainage.

State Inspection Service

The protection of consumers and manufacturers of agricultural products against fraudulent practices makes certain specialized laws necessary. These are classified as correct labeling laws, and are enforced by the State Inspection Service. Included in this legislation are the Feed, Fertilizer, Agricultural Liming Materials, and Pesticide Laws.

Soil Conservation

In 1937 the Maryland Legislation created the State Soil Conservation Committee in Maryland. The 24 districts organized under the law include all the land in the state.

The State Committee is charged with the responsibility of coordinating the efforts of the districts and encouraging the application of soil and water conservation practices.

Seed Inspection, Seed Certification, and Weed Control

The Seed Inspection Service administers the state seed law, inspects seeds sold throughout the state, collects seed samples for laboratory examination, reports the results of the examinations to the parties concerned, publishes summaries of these reports which show the relative reliability of the label information supplied by wholesale seedsmen; cleans and treats tobacco seed intended for planting in the state, makes analysis, tests, and examinations of seed samples submitted to the laboratory, and advises seed users regarding the economic and intelligent use of seeds. The Seed Inspection Service also conducts the Seed and Sod Certification Program and administers the Turfgrass Law.

The Weed Inspection Service implements the 1969 Johnson Grass Law. This law provides for (1) matching funds for joint State-County control and eradication programs, and (2) prevention of Johnson grass seed development.

Animal Health Department

The Animal Health Department is charged with the responsibility of preventing the introduction of diseases of animals and poultry from outside of the state and with control and eradication of such diseases within the state.

Facilities for the diagnosis of a wide variety of diseases are furnished in the main laboratory at College Park and in the branch laboratories at Salisbury, Centreville, Frederick, and Oakland.

Meat inspection is carried out under the Maryland Wholesome Meat Act of 1968. The act requires ante and post mortem inspection of all animals and their carcasses if used for human food, as well as processing and sanitation inspection.

The Maryland Poultry Productions Inspection Act of 1970 provides for similar inspection and sanitation of poultry products.

Office of Weights and Measures

The Office of Weights and Measures enforces the Weights and Measures Law as revised in 1951. All commercial weighing and measuring devices used in the State are tested annually. Other requirements relating to quantity in commercial transactions are also enforced.

COLLEGE OF AGRICULTURE

Administrative Officers

BENTZ, Frank L., Jr., Vice President for Agricultural Affairs and Associate Professor of Soils
B.S., University of Maryland, 1942; Ph.D., 1952.

CAIRNS, Gordon M., Dean and Professor of Dairy Science
B.S., Cornell University, 1936; M.S., 1938; Ph.D., 1940.

POFFENBERGER, Paul R., Associate Dean and Professor of Agricultural Economics
B.S., University of Maryland, 1935; M.S., 1937; Ph.D., American University, 1953.

HAUT, Irvin C., Director of Experiment Station and Professor of Horticulture
B.S., University of Idaho, 1928; M.S., State College of Washington, 1930; Ph.D., University of Maryland, 1933.

WAGNER, Robert E., Director of Extension and Professor of Agronomy
B.S., Kansas State College, 1942; M.S., University of Wisconsin, 1943; Ph.D., University of Wisconsin, 1950.

ELLINGTON, Charles P., Director, State Board of Agriculture Programs and Extension Assistant Professor of Agronomy
B.S., University of Georgia, 1950; M.S., University of Maryland, 1952; Ph.D., Pennsylvania State University, 1964.

Faculty

ALBERT, Thomas F., Assistant Professor of Veterinary Science
B.S., Pennsylvania State University, 1959; V.M.D., University of Pennsylvania, 1962.

ANGELL, Frederick F., Associate Professor of Horticulture
B.S., Southern Illinois University, 1960; M.S., 1961; Ph.D., University of Wisconsin, 1965.

ANGUS, Richard R., Assistant Professor and State Leader, 4-H and Youth
B.S., University of Minnesota, 1953; M.S., University of Minnesota, 1957.

ARBUCKLE, Wendell S., Professor of Dairy Science
B.S., Purdue University, 1933; M.A., University of Missouri, 1937; Ph.D., 1940.

AXLEY, John H., Professor of Soils
B.A., University of Wisconsin, 1937; Ph.D., 1945.

AYCOCK, Marvin K., Jr., Assistant Professor of Agronomy
B.S., North Carolina State University, 1959; M.S., 1963; Ph.D., Iowa State University, 1966.

BAILEY, Martin G., Assistant Professor and Extension Supervisor, Agriculture
B.S., Hampton Institute, 1937; M.Ed., Cornell University, 1955.

BAKER, Robert L., Assistant Professor of Horticulture
A.B., Swarthmore College, 1959; M.S., University of Maryland, 1962; Ph.D., 1965.

BANDEL, V. Allan, Associate Professor of Soils
B.S., University of Maryland, 1959; M.S., 1962; Ph.D., 1965.

BARNETT, Neal M., Assistant Professor of Botany
B.S., Purdue University, 1959; Ph.D., Duke University, 1966.

BAY, ERNEST C., Professor and Head of Entomology
A.A.S., Long Island Agricultural and Technical Institute, 1949; B.S., Cornell University, 1953; Ph.D., 1960.

BEAL, George M., Professor of Agricultural and Resource Economics
B.S., Utah State College, 1934; M.S., University of Wisconsin, 1938; Ph.D., 1942.

BEAN, George A., Assistant Professor of Plant Pathology
B.S., Cornell University, 1958; M.S., University of Minnesota, 1960; Ph.D., 1963.

BEITER, Robert J., Assistant Professor of Agricultural and Resource Economics
B.S., University of Maryland, 1952; M.S., 1957.

BELL, Frederick W., Cooperative Agent and Visiting Associate Professor of Agricultural and Resource Economics
Ph.D., Wayne State University, 1964.

BENDER, Filmore E., Associate Professor of Agricultural and Resource Economics
B.S., University of California, 1961; M.S., North Carolina State College, 1965; Ph.D., 1966.

BEZDICEK, David F., Assistant Professor of Soils
B.S., South Dakota State University, 1960; M.S., University of Minnesota, 1964; Ph.D., 1967.

BICKLEY, William E., Professor of Entomology
B.S., University of Tennessee, 1934; M.S., 1936; Ph.D., University of Maryland, 1940.

BIGBEE, Daniel E., Associate Professor Poultry Science
B.S., Oklahoma State University, 1956; M.S., 1958; Ph.D., Michigan State University, 1962.

BISHOP, Charles E., Chancellor of College Park campus and Professor of Agricultural and Resource Economics
B.S., Berea College, 1946; M.S., University of Kentucky, 1948; Ph.D., University of Chicago, 1952.

BORTHWICK, Harry A., Lecturer in Horticulture
A.B., Stanford University, 1921; M.A., 1924; Ph.D., 1930.

BOUWKAMP, John C., Assistant Professor of Horticulture
B.S., Michigan State University, 1964; M.S., 1966; Ph.D., 1969.

BRENNAN, Melvin C., Instructor, Visual Aids
B.S., University of Maryland, 1952.

BRICKER, A. June, Professor and State Leader, Extension Home Economics
B.S., Battle Creek College, 1935; M.A., New York University, 1953; Ph.D., New York University, 1961.

BRODIE, Herbert L., Instructor of Agricultural Engineering
B.S.A.E., Rutgers State University, 1964.

BROWN, Russell G., Associate Professor of Botany
B.S., West Virginia University, 1929; M.S., 1930; Ph.D., University of Maryland, 1934.

BUCHMAN, David T., Assistant Professor, Dairy Science
B.S., University of Maryland, 1961; M.S., 1963; Ph.D., University of Florida, 1966.

BULL, Leonard S., Assistant Professor of Dairy Science
B.S., Oklahoma State University, 1963; M.S., 1964; Ph.D., Cornell University, 1969.

BURIC, John, Associate Professor of Animal Science
B.S., West Virginia University, 1948; M.S., University of Maryland, 1952; Ph.D., University of Illinois, 1960.

BURT, Gordon W., Assistant Professor of Agronomy
B.S., Tennessee Technological University, 1961; M.S., Cornell University, 1964; Ph.D., Washington State University, 1967.

BUSBICE, Bobby G., Assistant Professor and Extension Supervisor, 4-H and Youth
B.S., Louisiana State University, 1950; M.S., University of Maryland, 1961.

CAIN, Jarvis L., Associate Professor of Agricultural and Resource Economics
B.S., 1955; Purdue University; M.S., Ohio State University, 1956; Ph.D., 1961.

CALDWELL, Billy E., Cooperative Agent and Visiting Associate Professor, Agronomy
B.S., North Carolina State College, 1955; M.S., 1959; Ph.D., Iowa State University, 1963.

CARON, Dewey M., Assistant Professor of Entomology
B.A., University of Vermont, 1964; M.S., University of Tennessee, 1966; Ph.D., Cornell, 1970.

CHANCE, Charles M., Associate Professor, Dairy Science
B.S., University of Maryland, 1941; M.S., Virginia Polytechnic Institute, 1948; Ph.D., Michigan State University, 1952.

CLARK, Neri A., Professor of Agronomy
B.S., University of Maryland, 1954; Ph.D., 1959.

CORBETT, M. Kenneth, Professor of Plant Pathology
B.S., Macdonald College, McGill University, 1950; Ph.D., Cornell University, 1954.

COWAN, Andrew M., Jr., Associate Professor of Agricultural Engineering
B.S.A.E., Purdue University, 1951; M.S., Iowa State College, 1955; Ph.D., 1967.

COX, Edwin L., Lecturer in Agricultural Biometrics
B.S., Mount Allison University, 1933; M.S., Acadia University, 1940; M.S., Virginia Polytechnical Institute, 1949; Ph.D., North Carolina State University, 1952.

CREEK, Richard D., Associate Professor of Poultry Science
B.S., Purdue University, 1951; M.S., 1954; Ph.D., 1955.

CROTHERS, John L., Jr., Assistant Professor, Department of Markets
B.S., University of Maryland, 1949; M.S., 1954.

CURTIS, Charles R., Assistant Professor of Plant Pathology
B.S., Colorado State University, 1961; M.S., 1963; Ph.D., 1965.

CURTIS, John M., Professor and Head of Agricultural and Resource Economics
B.S., North Carolina State College, 1947; M.S., 1949; Ph.D., University of Maryland, 1961.

DAVIDSON, John A., Assistant Professor of Entomology
B.A., Columbia Union College, 1955; M.S., University of Maryland, 1957; Ph.D., 1960.

DAVIS, Richard F., Professor and Head of Dairy Science
B.S., University of New Hampshire, 1960; M.S., Cornell University, 1952; Ph.D., 1953.

DEAL, Elwyn E., Associate Professor of Agronomy and Assistant Director of Extension
B.S., University of Georgia, 1958; M.S., 1960; Ph.D., Rutgers University, 1963.

DEBARTHE, Jerry V., Assistant Professor of Animal Science
B.S., Iowa State University, 1961; Ph.D., 1966.

DECKER, Morris A., Jr., Professor of Agronomy
B.S. Colorado A. & M., 1949; M.S., Utah State College, 1950; Ph.D., University of Maryland, 1953.

DOUGLASS, Larry W., Assistant Professor, Dairy Science
B.S., Purdue University, 1964; M.S., 1966, Ph.D., Oregon State University, 1969.

DUTTA, Sukanta K., Associate Professor of Veterinary Science
B.Sc. (Vet.) Bombay University, India, 1956; M.S., University of Minnesota, 1960; Ph.D., 1962.

EIGENBRODE, David D., Assistant Professor and Extension Supervisor, 4-H and Youth
B.S., University of Maryland, 1955; M.S., 1961.

EVANS, James G., Sr., Visiting Professor of Agricultural and Resource Economics
B.A., Simpson College, 1921; M.A., University of Illinois, 1924.

FANNING, Devlin S., Associate Professor of Soil Mineralogy
B.S., Cornell University, 1954; M.S., 1959; Ph.D., University of Wisconsin, 1964.

FARWELL, Sanford, Instructor and Exhibits Specialist
B.A., Rhode Island School of Design, 1954.

FELTON, Kenneth E., Associate Professor of Agricultural Engineering
B.S.A., University of Maryland, 1950; B.S.C.E., 1951; M.S., Pennsylvania State University, 1962.

FERNOW, Leonard R., Associate Professor of Geology
B.S., Cornell University, 1956; M.S., 1957; Ph.D., 1961.

FLYGER, Vagn F., Research Professor, Natural Resource Institute
B.S., Cornell University, 1948; M.S., Pennsylvania State University, 1952; Sc.D., Johns Hopkins University, 1956

FOSS, John E., Associate Professor of Soil Classification
B.S., Wisconsin State University, 1957; M.S., University of Minnesota, 1959; Ph.D., 1965.

FOSTER, Phillips W., Professor of Agricultural and Resource Economics
B.S., Cornell University, 1953; M.S., University of Illinois, 1956; Ph.D., 1958.

FRAZIER, Billie H. (Mrs.), Associate Professor and Human Development Specialist
B.S., Sam Houston State University, 1954; M.S., Texas Women's University, 1958; Ph.D., Florida State University, 1964.

GALLOWAY, Raymond A., Professor of Plant Physiology
B.S., University of Maryland, 1952; M.S., 1956; Ph.D., 1958.

GAUCH, Hugh G., Professor of Plant Physiology
B.S., Miami University, 1935; M.S., Kansas State College, 1937; Ph.D., University of Chicago, 1939.

GODFREY, Edward F., Professor of Poultry Science
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GOODWIN, Edwin E., Associate Professor of Animal Science
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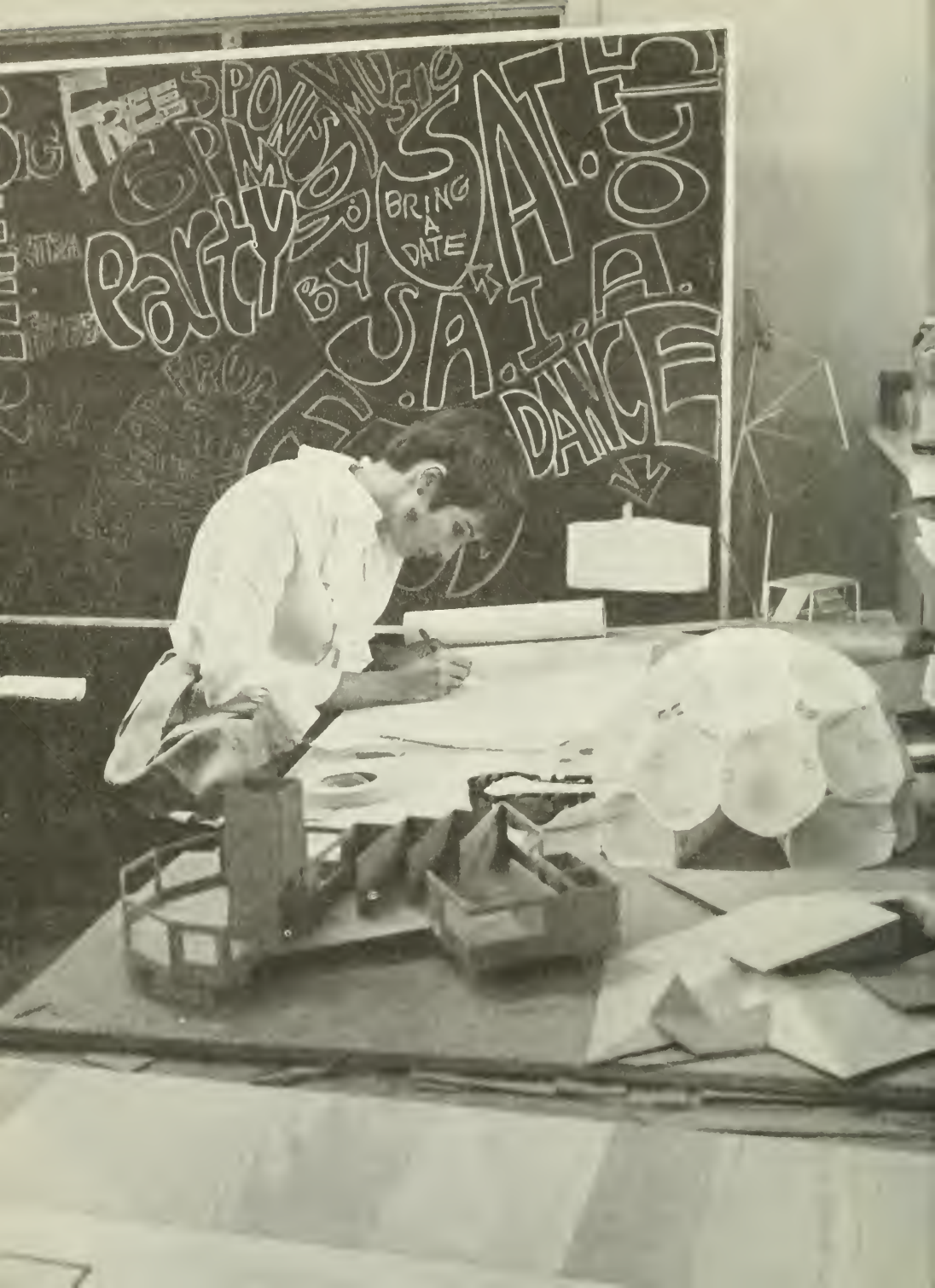
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Architecture

THE SCHOOL OF ARCHITECTURE offers a five-year undergraduate professional program leading to the degree, Bachelor of Architecture. Future plans include development of other environmental design programs at the graduate and undergraduate level.

The school is following established procedures of the National Architectural Accreditation Board, and it is anticipated that it will be accredited in accordance with policies of the NAAB, insuring that present and future students will be eligible for registration in all 50 states upon meeting experience requirements and passing the standard examination. The school is an associate member of the Association of Collegiate Schools of Architecture, and is assigned to that organization's Northeastern Region.

The curriculum presents the basic requisite skills and the opportunity to develop the knowledge to begin professional work. The school's goal is to prepare students for professional service in helping ameliorate the nation's environmental problems.

OPPORTUNITIES IN ARCHITECTURE

A rapidly expanding population, together with rapidly developing industrial civilization, has taxed the resources of cities throughout the world. Large segments of these urban populations are overcrowded, underserviced and deprived of many of the amenities which city life historically symbolizes. Many cities find themselves on the edge of economic, political and social disaster. Whole ethnic, racial and economic groups live in a continuing situation of environmental frustration. This urban crisis, which has come to fruition over the last generation, promises to dominate our domestic life in the United States for at least the generation to come.

The very complexity of these problems, precluding easy attribution of causes and obviating simple solutions, has generated great changes in the environmental design professions and in the other social disciplines. Where they once stood apart, they are now committed to a common purpose. Each of them has had to broaden its vision of service and concern, and has come to recognize the worth and value of the techniques and insights of the others.

In architecture, these exchanges have influenced the procedures, scope and services and goals of the profession. Recent years have seen the introduction of the ideas of urban sociology and the behavioral sciences into the area of professional concern, of the inclusion into professional procedures of linear programming, computer technology, operations research, mathematical and gaming simulation, and the use of analogue models. The scope of architectural services, once

confined to the design of and supervision of construction of buildings, has been broadened to include programming, developmental planning, operations research, project feasibility studies and other new professional activities. Finally, the role of the architect is expanding from a narrow concern with building design to a broad concern for developmental change, and his goal has developed from a preoccupation with beauty to a commitment to contributing to the enchancement of the quality of life.

These observations indicate both the great need for educated and trained professionals, and the relevancy and excitement which characterize the profession today. Perhaps at no time in history has architecture posed as great a challenge, nor offered so great a promise of personal fulfillment to its successful practitioners. There are many opportunities for employment and careers in architectural practice. Additional education and experience also qualify a graduate for a career in city or regional planning.

Moreover, the general nature of an architectural education is such that some graduates elect and achieve successful careers in related fields in civil service, commerce or industry.

THE CURRICULUM

The program permits students to enter the School of Architecture either directly from high school or after one year of general college work without extending the time required for completion of degree requirements.

Students in the first year may take an introductory course in the history of architecture as well as general courses. In the second year, the student begins his professional education in the basic environmental design studio course as well as continuing his general education. The basic environmental design studio explores specific architectural problems as well as the general problems inherent in making objects and making spaces. In the third year, coordinated courses in design and building systems introduce the student to the ecological, physiographic, physiological, social, and physical generators of archtecture design; and the student is given an introduction into building technology. In the fourth year, this process is continued, but the emphasis is on urban design factors: the environmental context, the historical and situation context, urban systems, and theoretical, aesthetic and sociological considerations. In the fifth year of design, the student is offered an opportunity to choose a comprehensive topical problem from several offered each year, including special studies in technical areas as well as building design and case studies in urban planning.

All of the design studio courses emphasize environmental design problem solving experiences to advance the student's skill in the field, as well as lectures, reading assignments, field trips, etc. In addition to the design and technical courses, the student is required to take four semesters of architectural history, of which two are selected from a number of options, several liberal and physical sciences, and a number of electives and professional electives. The latter may be chosen from among those offered by the school's faculty as well as from among selected courses offered by other departments. A list of professional electives is presented elsewhere in this section.

The general education requirements of the University apply generally to the architecture program, but architectural students are specifically required to complete math through MATH 220 and 221. Most students find it necessary to begin college math with MATH 115, followed by MATH 220 and 221. In addition, architecture students are required to complete Physics 121, Biology 101 and Computer Science 103.

LOCATION

A permanent, contemporary, air-conditioned building from the school is under construction and should be completed during 1971.

Meanwhile, temporary facilities in a World War II wooden, one-story barracks complex on the campus provide adequate studio space, a library, exhibit space, classroom and lecture hall facilities, and office space.

LIBRARY

The Architectural School Library at present comprises some 8,000 volumes. It is expected that the library will number 12,000 to 15,000 volumes by 1972. This will make it one of the major architectural school libraries in the nation. The library subscribes to about 100 foreign and domestic periodicals providing resources in urban sociology, building technology and urban planning as well as in architecture.

The visual aids library presently comprises about 30,000 35-mm. color slides in architecture, landscape architecture and urban planning.

ADMISSION

Because there is a fixed limit to the number of candidates who can be admitted each year, it is important that the following instructions be carefully followed:

1. *Students applying from high school:* write the Director of Admissions, University of Maryland, College Park, Md. 20742 for application instructions;
2. *Students who have completed work at other universities:* write the Director of Admissions, University of Maryland, College Park, Md. 20742 for application instructions;

3. *Students transferring from other colleges of the University of Maryland:* please pick up an application record form at the School of Architecture, and return it to the assistant dean of the School, together with a record of all work taken at the University of Maryland.

Deadlines: all application procedures should be completed and materials in hand at the University by March 1. Applications received after this date, but before the University deadline dates for new students and for transfer students, will be considered only on a space-available basis.

FINANCIAL ASSISTANCE

For promising young men and women who might not otherwise be able to attend the University's School of Architecture, a number of grants and scholarships are available, some earmarked specifically for architectural students. New students must apply before March 15. Students already enrolled may apply before May 1. All requests for information concerning these awards should be directed to: Director, Student Aid, University of Maryland, College Park, Md. 20742.

REQUIREMENTS FOR GRADUATION

Since the school is entering its fifth year of operation, all of its proposed courses have not yet been approved by appropriate University authorities. Consequently, the five-year curriculum in architecture which follows is labelled "tentative." However, it can be anticipated that most, if not all, requirements will be approved.

Students in architecture are required to complete a minimum of 169 credits of work for the Bachelor of Architecture degree. In addition to prescribed courses in the School of Architecture, students are required to complete a number of credits in electives offered elswhere in the University. The requirements for graduation are tabulated below:

	Credits
Studio Courses	36
Systems and Technology Courses	16
Architectural History Courses	12
Math	9
Computer Science	3
Physics and Biology	7
Theory of Urban Form	3
Professional Practice	2
Professional Electives	17 to 38
Electives	15 to 36
General Education (see curriculum)	24
P.E.	2
Health	2
(minimum)	169

Distribution	Credits
Minimum architecture courses	69
General Education, Math, Physics, Health and P.E.	47
Professional Electives and Electives	53
	169

Tentative Five-Year Curriculum in Architecture

First Year

Fall		Spring	
*(G.E.) (Social Science Option)	3	(G.E.) (Social Science Option)	3
(G.E.) Math 115**	3	(G.E.) Math 220	3
(G.E.) English 101	3	(G.E.) English 201	3
(G.E.) (History Option)	3	(G.E.) (History Option)	3
Arch 120 Hist. Mod. Env. Des.	3	Arch. 121 Hist. Mod. Env. Des.	3
P.E.	1	P.E.	1
Health 105	2		
	18		16

*G.E. refers to courses meeting University general education requirements.
**Students may be placed directly in Math 14 or higher by review of high school & SAT record.

Second Year

Fall		Spring	
Arch. 200 Basic Env. Design	4	Arch. 201 Basic Env. Design	4
(G.E.) Physics 121	4	Biology 101	3
(G.E.) English 202	3	(G.E.) (Art survey recommended)	3
(G.E.) Math 221	3	Computer Science 103	3
Prof. Elective or Elective**	3	Prof. Elective or Elective**	3
	17		16

Third Year

Fall		Spring	
Arch. 300 Arch. Studio I	4	Arch. 301 Arch. Studio II	4
Arch. 310 Building Systems I	4	Arch. 311 Building Systems II	4
Architectural History*	3	Architectural History*	3
Arch. 350 Theory of Urban Form	3	Prof. Elective or Elective**	3
Prof. Elective or Elective**	3	Elective	3
	17		17

Fourth Year

Fall		Spring	
Arch. 400 Arch. Studio III	4	Arch. 401 Arch. Studio IV	4
Arch. 410 Building Systems III	4	Arch. 411 Building Systems IV	4
Prof. Elective**	3	Prof. Elective**	3
Prof. Elective or Elective**	3	Prof. Elective or Elective**	3
Elective	3	Elective	3
	17		17

Fifth Year

Fall		Spring	
Arch. 501 Adv. Topical Prob	6	Arch. 502 Adv. Topical Prob	6
Prof. Electives**	6	Prof. Electives**	5
Arch. 570 Prof. Practice	2	Prof. Elective or Elective**	3
Elective	3	Elective	3
	17		17

*May be selected from among several History of Architecture courses. (May be taken in other years by permission).
**Professional Electives—see listing of Professional Electives.

PROFESSIONAL ELECTIVES

The following courses are presently accepted by the faculty in architecture as meeting the professional elective requirements.

Course No.	Name	Credits	Prerequisites
Anthropology			
101	Intro. to Anth: Archaeol. and Phy.	3	Meets G.E.
102	Intro. to Anth: Cult. Anth. and Ling.	3	none
221	Man and Environment	3	Soph. stdg.
241	Intro. to Archaeology	3	Soph. stdg.
401	Cultural Anthropology	3	Anth. 101, 102, 221
441	Archaeology of Old World	3	Anth. 101, 241
451	Archaeology of New World	3	Anth. 101, 241
Architecture			
240	Basic Photography	2	Perm. of Instr.
340	Advanced Photography	2	Arch. 240
370	Theories and Lit. of Architecture	3	Perm. of Instr.
372	Signs, Symbols and Messages in Arch.	3	Perm. of Instr.
Business Administration			
362	Labor Relations	3	Jr. stdg.
370	Prin. of Transportation	3	Econ. 205 and jr. stdg.
474	Urban Trans. and Urb. Dev.	3	Econ. 205 and
380, 381	Business Law	3	jr. stdg.
393	Real Estate Prin.	3	Econ. 205 and
490	Urban Land Management	3	jr. stdg.
Computer Science			
210	Languages and Struct. Computers	3	CMSC 103
440	Struct. of Programming Lang.	3	Jr. stdg., CMSC 210
420	Data and Storage Structures	3	Jr. stdg., CMSC 210
Economics			
205	Fund. of Economics	3	Soph. stdg.
491	Intro. to Reg. and Urban Econ.	3	Perm. of Instr.
450	Intro. to Public Finance	3	Econ. 205
454	State and Local Public Finance	3	Econ. 205
461	Economics of American Industry	3	Econ. 205
General Education			
GNED 260	Intro. to Interdisciplinary Urban Studies	3	
Geography			
201	General Geography	3	none
452	Population Geography	3	Geog. 201, Perm. of Instr.
455	Urban Geography	3	Jr. stdg.
Geology			
100	Geology	3	none
110	Physical Geology Lab.	1	none
Information System Management			
401	Electronic Data Processing	3	Jr. stdg., CMSC 103
402	Electronic Data Processing Applications	3	Jr. stdg., ISM 401
Psychology			
100	Intro. to Psych.	3	Meets G.E.
221	Social Psychology	3	Psych. 1
462	Engineering Psychology	3	Psych. 1 or Perm. of Instr.
Sociology			
100	Intro. to Sociology	3	Meets G.E.
120	Urban Sociology	3	Soc. 1
210	Social Pathology	3	Soc. 1, soph. stdg.
471	The Rural Community	3	Soc. 1, jr. stdg.
473	The City	3	Soc. 1, jr. stdg.
330	Community Organization	3	Soc. 1, jr. stdg.
423	Ethnic Minorities	3	Soc. 1, jr. stdg.
424	Sociology of Race Relations	3	Soc. 1, jr. stdg.
445	Sociology of the Arts	3	Soc. 1, jr. stdg.
Statistics and Probability			
250	Intro. to Random Variables	4	Math. 221
Art			
110	Life Drawing	3	

FACULTY

Professors: Cochran, Hill, Schlesinger, Skiadaressis (Visiting), Moore (Kea Distinguished Professor).

Associate Professors: Ekstrom, Hutton, Potts, Schack, Shaeffer, D. Wiebenson, J. Wiebenson.

Assistant Professors: Chabrowe, Lewis, Kaskey, Lazaris, Payne.

Lecturers: Carter, Davis, Fogle, Thomas, Wilkes.

COURSE DESCRIPTIONS

ARCH 120 (014). HISTORY OF ARCHITECTURE. (3)
Survey of architectural history. Lecture, 3 hours per week.

ARCH 121 (015). HISTORY OF ARCHITECTURE. (3)
Prerequisite, ARCH 120. Lecture, 3 hours per week.

ARCH 200 (020). BASIC ENVIRONMENTAL DESIGN. (4)
Introduction to the processes of visual and architectural design, including the study of visual design fundamentals. Field problems involving the student in the study of actual developmental problems. Lecture, studio, 9 hours per week.

ARCH 201 (021). BASIC ENVIRONMENTAL DESIGN. (4)
Prerequisite, Architecture 200. Introduction to the processes of visual and architectural design, including the study of visual design fundamentals. Field problems involving the student in the study of actual developmental problems. Lecture, studio, 9 hours per week.

ARCH 240 (080). BASIC PHOTOGRAPHY. (2)
Provides a student with the basic concepts of clarity and organization on a two-dimensional surface and stresses photography as a tool for visual communication. Lecture 1 hour per week—3 hours lab a week.

ARCH 270 (030). INTRODUCTION TO THE BUILT ENVIRONMENT. (3)
Introduction of (1) conceptual, perceptual, behavioral and technical aspects of the environment; and, (2) methods of analysis, problem solving and implementation. For students not majoring in architecture. Prerequisites, none. Lecture, seminar, 3 hours per week.

ARCH 300 (130). ARCHITECTURE STUDIO I. (4)
Prerequisites, ARCH 200, 201. Develops a basic understanding of the elements of environmental control, basic structural systems, building processes, materials, and the ability to manipulate them. Lecture, studio, 9 hours per week. Corequisite—Architecture 132.

ARCH 301 (131). ARCHITECTURE STUDIO II. (4)
Prerequisites, Architecture 300. Develops a basic understanding of the forms generated by different structural systems, environmental controls and methods of construction. Lecture, studio, 9 hours per week. Corequisite —ARCH 311.

ARCH 310 (132). BUILDING SYSTEMS I. (4)
Prerequisites, MATH 221, Physics 122 and ARCH 201. Introduction to architectural science and technology treat-

ing principles of structures, environmental mechanical controls, and construction. Corequisite: Architecture 300. Lecture, studio, 6 hours per week.

ARCH 311 (133). BUILDING SYSTEMS II. (4)
Prerequisite, Architecture 300 and 310. Develops working knowledge of the design principles and parameters of three areas of architectural science and technology. structures, environmental-mechanical controls, and construction. Lecture, studio, 6 hours per week. Corequisite, Architecture 301.

ARCH 322 (135). STUDIES IN MEDIEVAL ARCHITECTURE. (3)
Limited to architecture students or by permission of the instructor. Architectural innovations from the Carolingian through the Gothic periods. Lecture, 3 hours per week.

ARCH 324 (144). STUDIES IN RENAISSANCE ARCHITECTURE. (3)
Limited to architecture students or by permission of the instructor. Study of Renaissance architectural principles and their development in the Baroque period. Lecture, 3 hours per week.

ARCH 326 (145). STUDIES IN MODERN ARCHITECTURE. (3)
Limited to architecture students or by permission of the instructor. Study of architectural problems from 1750 to the present. Lecture, 3 hours per week.

ARCH 340 (081). ADVANCED PHOTOGRAPHY. (2)
Prerequisite, Architecture 240. Allows the student to investigate independently areas of photographic communication not covered in the basic course. Lecture, 1 hour per week; 3 hours lab.

ARCH 342 (146). STUDIES IN VISUAL DESIGN. (3)
Studio work at an intermediate level in visual design divorced from architectural problem solving. Prerequisite, Arch 201. Lecture, studio work, 3 hours per week.

ARCH 350 (136). THEORY OF URBAN FORM. (3)
Urban spatial forms of the past and present; theories of design of complexes of buildings, urban space and communities. Lecture, 3 hours per week.

ARCH 352 (148). THE ARCHITECT IN THE COMMUNITY. (3)
The architect's role in the social and political dynamics of urban environmental design decision-making processes, including study of determination and expression of user needs, community aspirations, formal and informal program and design review processes. Seminar, 1 hour per week, field observavtion, approximately 3 hours per week.

ARCH 370 (180). THEORIES AND LITERATURE OF ARCHITECTURE. (3)
Limited to architecture students or by permission of the instructor. Provides an understanding of some historical and present theories of architectural design readings and seminar discussions. Lecture, 3 hours per week.

ARCH 372 (182). SIGNS, SYMBOL AND MESSAGES IN ARCHITECTURE. (3)
Limited to Architecture students or by permission of the instructor. Class limited to 15-20 students. Signs and symbols in buildings and cities, messages conveyed and purposes for conveying these messages. Readings, photographic reports and minor problem-solving assignments. Lecture, 3 hours per week.

ARCH 374 (137). COMPUTER AIDED ENVIRONMENTAL DESIGN. (3)
Applications of computer-aided design in architecture, using existing problem-solving routines and computer graphic techniques. Prerequisite, Arch. 201, CMSC 103. Lecture. 3 hours per week.

ARCH 400 (140). ARCHITECTURE STUDIO III. (4)
Continuation of design studio, with emphasis on comprehensive building design and introduction to urban design factors. Prerequisites, Architecture 301 and Architecture 311. Corequisite, Architecture 410, except by permission of the Dean. Lecture, studio, 9 hours per week.

ARCH 401 (141). ARCHITECTURE STUDIO IV. (4)
Continuation of design studio, with emphasis on urban design factors. Prerequisites, Architecture 400 and Architecture 410. Corequisite, Architecture 411, except by permission of the Dean. Lecture, studio, 9 hours per week.

ARCH 410 (142). BUILDING SYSTEMS III. (4)
Applications of principles in architectural structures, environmental controls and construction. Prerequisites: Architecture 301 and Architecture 311. Corequisite, Architecture 400. Lecture, studio, 6 hours per week.

ARCH 411 (143). BUILDING SYSTEMS IV. (4)
Applications of principles and further analysis of systems and hardware in architectural structures, environmental controls and construction. Prerequisites, Architecture 400 and Architecture 410. Corequisite, Architecture 401. Lecture, studio, 6 hours per week.

ARCH 413 (153). STRUCTURAL SYSTEMS IN ARCHITECTURE. (3)
Theory and application of selected complex structural systems as they relate to architectural decisions. Prerequisite, Arch. 410 or by permission of the instructor. Seminar, 3 hours per week.

ARCH 420 (154). HISTORY OF AMERICAN ARCHITECTURE, 17TH CENTURY TO 19TH CENTURY. (3)
History of American Architecture—17th to 19th Century. Prerequisite, Architecture 014 and 015. Lecture, 3 hours per week.

ARCH 421 (155). HISTORY OF AMERICAN ARCHITECTURE, 19TH AND 20TH CENTURY. (3)
Prerequisite Architecture 120, 121, and 420. History of American Architecture 19th and 20th Centuries. Lecture, 3 hours per week.

ARCH 422 (156). LATE 18TH CENTURY PARISIAN ARCHITECTURE. (3)
The theoretical background, formulation, and development of late Eighteenth Century architecture in Paris, and its relationship to contemporaneous British and continental developments in architecture and peripheral fields. A reading knowledge of French will be required. Colloquium, independent research. By permission of the instructor.

ARCH 427 (164). INDEPENDENT STUDIES IN THE HISTORY OF ARCHITECTURE. (3)
Permission of the instructor. Independent research in architectural history. Lecture, 3 hours per week.

ARCH 472 (185). ECONOMIC DETERMINANTS OF ARCHITECTURE. (3)
Introduction of economic aspects of present day architecture: government policy, land evaluation, and project financing; construction materials and labor costs; cost analysis and control systems. Architecture majors, except by permission of instructor. Lecture, seminar, 3 hours per week.

ARCH 478 (165). DIRECTED STUDIES IN ARCHITECTURE. (1-4)
Directed study under individual faculty guidance with enrollment limited to advanced undergraduate students. Project proposals must receive a recommendation from the School Curriculum Committee and approval of the Dean of the School prior to registration. Public oral presentation to the faculty of a final report or project will be required at final submission for credit.

ARCH 512 (—). ADVANCED STRUCTURAL ANALYSIS IN ARCHITECTURE. (3)
Qualitative and quantitative analysis and design of selected complex structural systems and methods. Prerequisite, Architecture 411. Seminars, laboratory, field trips, 3 hours per week.

ARCH 514 (—). ENVIRONMENTAL SYSTEMS IN ARCHITECTURE. (3)
Qualitative analysis of selected environmental systems as design determinants. Prerequisite, Architecture 411. Lecture, laboratory, 3 hours per week.

ARCH 570 (—). INTRODUCTION TO PROFESSIONAL MANAGEMENT. (2)
Introduction to architectural professional practice management, including social, organizational, project management, legal and cost control aspects of the performance of complex, comprehensive environmental design services. Lecture, 2 hours per week.

SCHOOL OF ARCHITECTURE

Administrative Officers

HILL, John W., Dean of the School of Architecture and Professor of Architecture
B.A., Rice, 1951; B. Arch., Rice, 1952; M. Arch., University of Pennsylvania, 1959.

HUTTON, Dale J., Assistant Dean and Associate Professor of Architecture
B. Arch., Texas A & M, 1960; M.S. Arch., Columbia, 1961.

RATCLIFF, Calliopi, Secretary to the Dean, Office Manager

Faculty

ALLEY, Elizabeth, Curator of Visual Aids
B.A. Art History, Wilson College, 1948.

BECHHOEFER, William B., Instructor
A.B., Harvard College, 1963; M. Arch., Harvard Graduate School of Design, 1967.

CARTER, Donald G., Lecturer (P.T.)
B.S. Mechanical Engineering, Washington University, 1949.

CHABROWE, Barbara, Assistant Professor
Diploma D'Etudes, Sorbonne, 1958; B.A., Hunter College, 1963; M.A. Art History, Columbia, 1965; Ph.D. Art History, Columbia 1970.

COCHRAN, Alexander S., Professor (P.T.)
A.B., Princeton, 1935; B. Arch., Harvard Graduate School of Design, 1939.

DAVIS, Freemont, Lecturer (P.T.)

EKSTROM, Rurik F., Associate Professor
B. Arch., University of Virginia, 1957; MFA Arch., Yale, 1961.

FOGLE, David P., Lecturer
A.B. Arch., Princeton University, 1951; MCP, University of California, 1958.

KASKEY, Raymond J., Assistant Professor
B. Arch., Carneige Institute of Technology, 1967; M. Environmental Design, Yale, 1969.

KRAMER, Arnold N., Instructor (P.T.)
B.S. Electrical Engineering, M.I.T., 1966; M.S. Electrical Engineering, M.I.T., 1968.

LAZARIS, Evangelos S., Assistant Professor
B. Arch., University of Oregon, 1968; M.S. Arch. Science & Technology, Cornell, 1970.

LEWIS, Roger K., Assistant Professor
B. Arch., M.I.T., 1964; M. Arch., M.I.T., 1967.

MOORE, Charles W., Kea Distinguished Professor (1971-72)
B. Arch., University of Michigan, 1947; M.F.A., Princeton University, 1956; Ph.D., Princeton University, 1957.

NEAL, Berna, Librarian
B.A., Syracuse University, 1957; M.S. Library Science, Syracuse University, 1960.

NIX, I. Lewis, Instructor
B. Arch., University of Virginia, 1968; M. Environmental Design, Yale, 1970.

PAYNE, Ifan, Assistant Professor
B. Arch., Welsh School of Architecture, 1966; Ph.D., Architectural Science, Bartlett School of Architecture, 1969.

POTTS, William H. Jr., Associate Professor (P.T.)
B.A., UCLA, 1947; B.Arch., University of Florida, 1951; M.A., Harvard, 1956.

SCHACK, Mario, Associate Professor (P.T.)
Diploma of Architecture, Swiss Federal Institute of Technology, 1960; M. Arch., Harvard, 1961.

SCHLESINGER, Frank, Lecturer
B.S., University of Illinois, 1950; B. Arch., Harvard Graduate School of Design, 1954.

SHAEFFER, Ronald E., Associate Professor
B.S. Building Science, Rensselaer Polytechnic Institute, 1961; M.S. Arch. Engineering, Iowa State University, 1963.

SKIADARESSIS, George A., Visting Professor
M.S. Civil Engineering, Technical University of Munich, 1941; M. City Planning, M.I.T., 1952; M. Arch., M.I.T., 1953.

THOMAS, Frederick H., Lecturer
B. Arch., Howard University, 1958.

WIEBENSON, Dora L., Associate Professor
A.B., Vassar College, 1946; B. Arch., Harvard, 1951; A.M. Fine Arts, New York University, 1958; Ph.D. Fine Arts, New York University, 1964.

WILKES, Joseph A., Lecturer (P.T.)
B.A., Dartmouth College, 1941; B. Arch., Columbia, 1949.

Arts & Sciences

THE COLLEGE OF ARTS AND SCIENCES offers its students a liberal education. It seeks to develop graduates who can deal intelligently with the problems which confront them and whose general education will be a continuing source not only of material well-being but of genuine personal satisfaction. It also offers each student the opportunity to concentrate in the field of his choice; this element of depth serves both as an integral part of his education and as a foundation for further professional training or pursuits.

This college is an outgrowth of the Division of Language and Literature and the Division of Applied Science and the later School of Liberal Arts of Maryland State College. In 1921 the School of Liberal Arts and the School of Chemistry were combined and other physical and biological sciences were brought into the newly formed College of Arts and Sciences. In later reorganizations some departments have been added and some transferred to the administrative control of other colleges.*

ADMISSION

The requirements for admission to the College of Arts and Sciences are, in general, the same as those for admission to the other colleges and schools of the University. Application must be made to the Director of Admissions, University of Maryland, College Park, Maryland.

The student who intends to pursue a program of study in the College of Arts and Sciences should include the following subjects in his high school program: English, four units; college preparatory mathematics (algebra, plane geometry), three or four units; foreign language, two or more units; biology, chemistry, or physics, two units; history and social sciences, one or more units.

The student who wishes to major in chemistry, mathematics, physics, botany, microbiology, zoology, or who wishes to follow a pre-medical or pre-dental program, should include four units of college preparatory mathematics (algebra, plane geometry, trigonometry, and more advanced mathematics, if available). He should also include chemistry and physics.

DEGREES

Students of this college who satisfactorily complete curricula with majors in departments of the humanities or social sciences are awarded the degree of Bachelor of Arts. Those who satisfactorily complete curricula with majors in the Department of Mathematics or the biological and physical sciences are awarded the degree of Bachelor of Science. Those who complete satisfactorily a special professional program in the Department of Music are awarded the degree of Bachelor of Music.

*The Departments of Botany, Economics, Geography, and Government and Politics, although administratively in the College of Business and Public Administration, or the College of Agriculture, offer courses for Arts and Sciences students. Majors may be elected in these departments as in those of the departments administered by the College of Arts and Sciences.

GENERAL REQUIREMENTS FOR DEGREES

The baccalaureate degree from the College of Arts and Sciences may be conferred upon a student who has satisfied the following requirements:

1. General Education requirements.
2. College of Arts and Sciences requirements.

COLLEGE REQUIREMENTS

The college requires a certain degree of exposure to, and hopefully proficiency in, the knowledge of a language and culture of some country other than Anglo-American. This may be met in several ways:

1. a) A student who has successfully completed at least through *"level 3"* of *one* foreign language at the high school level, or
   b) A student who has successfully completed at least two years *("level 2") of two* different foreign languages at the high school level need not take additional foreign languages at the college level to satisfy the requirements of the college.
2. A student who does not meet the requirements under paragraph 1, must show proficiency through the intermediate level of college language. This may be done as follows:
   a) Take the placement examination in the language in which he has background—two years in high school—and begin at the college level indicated by the test and continue through the intermediate level; or
   b) Pass the proficiency test for intermediate level given by the respective language departments.

Referring to paragraph 1, the following should be noted:

a) Certain departments still require language at the college level to fulfill major requirements. Also, certain honor societies still require language at the college level among the requirements for selection to membership; in many graduate programs, proficiency in foreign languages is still required while the requirement for professional schools varies and *it becomes the responsibility of the student* to meet the requirements of the school of his choice.

b) In interpreting this paragraph, the college accepts the information that appears on his high school transcript at the time the student registers for his first semester in the University.

The languages which may be offered to meet this requirement are Chinese, French, German, Greek, Hebrew, Italian, Latin, Portuguese, Russian, Spanish, and Swahili.

Foreign students may satisfy this requirement by offering twelve hours of English in addition to the regular English requirement. A foreign student may not meet the foreign language requirement by taking freshman or sophomore courses in his native language.

Normally a student shall not be permitted to repeat a foreign language course below Course 200 for credit if he has successfully completed a higher numbered course than the one he wishes to repeat. Credit (including elective credit) will be given for the first semester of a language only if credit has been earned in additional courses in the same language.

2. SPEECH. If a student has had one full unit of public speaking in high school covering an entire academic year, he is not required to take a speech course at the college level, though he may elect to do so.

Those students who need to take speech at the college level to complete the one-semester requirement may choose one course from the following: SPCH 100, 107, 125, or 220. In certain situations other courses may be substituted: i.e., pre-law students may take SPCH 230, and foreign students should take SPHR 202, Fundamentals of American Speech.

3. MAJOR AND MINOR REQUIREMENTS. Specific descriptions of the departmental, inter-departmental, or pre-professional majors are found, in alphabetical order, along with the course offerings in the following section of this catalog. The general college regulations controlling majors (and supporting courses) are as follows.

Each student chooses a field of concentration (major). He may make this choice as early as he wishes; however, once he has earned 56 hours of acceptable credit he *must* choose a major before his next registration.

In the program leading to the B.A. degree, the student must also have a secondary field of concentration (minor or supporting courses). The courses constituting the major and the supporting courses must conform to the requirements of the department in which the work is done.

The student must have an average of not less than C in the introductory courses in the field in which he intends to major.

A major shall consist, in addition to the underclass departmental requirements, of 24-40 hours, of which at least twelve must be in courses numbered 300 or 400 and at least twelve of which must be taken in the University of Maryland.

Each major program includes a group of "supporting courses," formerly called minors, that are designed to contribute to a better understanding of the major. The nature and number of these courses are under the control of the major department. Except in certain specialized curricula approved by the dean, not more than one-half of the supporting courses may be taken outside of the College of Arts and Sciences.

The average grade of the work taken for the major must be at least C; some departments will

count toward satisfaction of the major requirement no course completed with a grade of less than C. The average grade of the work taken in the major and supporting courses combined must be at least C. A general average of C in courses taken at the University of Maryland is required for graduation.

Courses taken to fulfill the requirements in General Education may not be used toward major or supporting courses requirements.

JUNIOR REQUIREMENTS

To attain junior standing, a student must acquire a minimum of 56 academic* semester hours and be eligible to re-register in the University.

NORMAL LOAD

A minimum of 120 semester hours credit, exclusive of required courses in physical activities and health, is required for graduation. The normal load for students in this college is 15 semester hours credit per semester, exclusive of the required work in physical activities and health.

A student must have the approval of his advisor and dean to take more than the normal program prescribed in his curriculum.

ADVISORS

Each freshman in this college will be assigned to a faculty advisor who will help the student, during his first year, to select his courses and to determine what his field of major concentration should be.

The student at the sophomore level and above will be advised by a faculty member in his major department. Students following the three-year programs in dentistry, law, and medicine will be advised by special advisors for these programs.

ELECTIVES IN OTHER SCHOOLS AND COLLEGES

A limited number of courses taken in other colleges and schools of the university may be counted for *elective* or supporting credit toward a degree in the College of Arts and Sciences. The number of credits which may be accepted from the various colleges and schools is as follows: College of Education—24; all other colleges or independent departments—20. The combined credits from other colleges and schools shall not exceed 20 (or 24 if courses in education are included). Courses taken in professional schools are not accepted towards a degree in this College.

CERTIFICATION OF HIGH SCHOOL TEACHERS

If courses are properly chosen in the field of education, a prospective high school teacher can prepare for high school positions, with a major and supporting courses in certain of the departments of this college. A student who wishes to work for a teacher's certificate must consult the College of Education in the second semester of his sophomore year and apply for admission to the "Teacher Education" program.

HONORS

The aim of the College Honors Programs is to recognize and encourage superior scholarship. To this end, Honors work offers the gifted student challenging opportunities to work in small groups with carefully chosen instructors and to move at a speed appropriate to his capacities in an atmosphere conducive both to independent study and to growth in intellectual maturity. The college conducts both General and Departmental Honors Programs spanning the four undergraduate years. For information concerning the General Honors Program, see below, under "Honors."

For information concerning the Departmental Honors Programs, consult the various departmental entries in this catalog. It may, however, be remarked that the Departmental Honors Programs are administered by a Honors Committee within each department. Admission to a Departmental Honors Program ordinarily occurs at the beginning of the first or second semester of the student's junior year. As a rule, only students with a cumulative grade point average of at least 3.0 are admitted. A comprehensive examination over the field of his major program is given to a candidate near the end of his senior year. On the basis of the student's performance on the Honors Comprehensive Examination and in meeting such other requirements as may be set by the Departmental Honors Committee, the faculty may vote to recommend the candidate for the appropriate degree with (departmental) HONORS, or for the appropriate degree with (departmental) HIGH HONORS. Successful candidacy will be symbolized by appropriate announcement in the commencement program and by citation on the student's academic record and diploma.

Students in the General and Departmental Honors Programs enjoy some academic privileges similar to those of graduate students.

PHI BETA KAPPA

Phi Beta Kappa is the oldest and most widely respected honorary fraternity in the United States. Election to membership is based not only on outstanding scholastic achievement, but also on breadth of liberal arts studies completed while enrolled at the University of Maryland. Gamma of Maryland chapter has liaison faculty members in the various departments in the College of Arts and Sciences with whom students may discuss membership selection. It should be kept in mind that requirements for national honorary societies often differ from the local college or university requirements.

*Not including Health 5 and required PHED.

AFRO-AMERICAN STUDIES PROGRAM

Associate Professor and Acting Director: Berry.
Instructor and Assistant Director: Nzuwah.
Lecturer: Muganda.

The program is designed for a student who wants to take a major in an established department as well as follow a concentration outside his major of 18 hours of upper division course work with an emphasis on black culture and life for which he will receive a Certificate in Afro-American Studies. The work includes courses in art, African languages, anthropology, economics, English, government, history, music and sociology.

An undergraduate in good standing in a college of the University of Maryland may enroll in the program by consulting with his departmental advisor and an advisor of the Afro-American Studies Program. The student following this program must meet the general requirements for a degree in his college.

To receive a Certificate in Afro-American Studies, the student must enroll and receive a satisfactory grade in at least three (3) of the required courses which must include AASP 401, Seminar in Afro-American Studies. (See list of Required Courses below). In addition, the student may also choose a number of approved courses from the list of recommended electives to meet the minimum requirements of 18 credit hours. (See list of Recommended Electives below.)

A student planning to enter the program should consult with the director of Afro-American Studies regarding prerequisites, approved electives and introductory courses.

COURSES:

I. Required Courses:

AASP 400 (100). DIRECTED READINGS IN AFRO-AMERI-STUDIES. (3)

AASP 401 (101). SEMINAR ON AFRO-AMERICAN STUDIES. (3) (Berry)

ENGL 443 (167). AFRO-AMERICAN LITERATURE. (3) (Naughton)

HIUS 416 (117). BLACKS IN AMERICAN LIFE. (3) (Berry)

SOCY 424 (124). SOCIOLOGY OF RACE RELATIONS. (3) (McIntyre)

II. Recommended Electives:

AASP 101 (110). ELEMENTARY SWAHILI. (3)
Fall and spring semesters. An introductory course in the Swahili language. Study of linguistic structure and development of audio-lingual ability. Three recitations and one laboratory hour per week. (Staff)

AASP 102 (111). INTERMEDIATE SWAHILI. (3)
Fall and spring semesters. Three recitations and one laboratory hour per week. Further study of linguistic structure and development of audio-lingual and writing ability, and introduction to the reading of literary texts. (Staff)

AASP 112 (New). ADVANCED SWAHILI. (3)
Fall and spring semesters, beginning Spring 1972. For students who wish to develop fluency and confidence in the speaking, reading and writing of Swahili language. Discussions in Swahili. (Staff)

Also recommended:

ANTH 424, ECON 475, ECON 490, ENGL 464, GVPT 432, GVPT 434, GVPT 454, GVPT 484, HIFN 473, HIFN 474, HIST 398.

AMERICAN STUDIES

Professor and Director: Beall.

Assistant Professors: Lounsbury and Mintz.

Advisory Committee: Beall (Chairman, American Studies), Fry (English), Grimsted (History), Lounsbury (American Studies), Mintz (American Studies), Schwartz (Sociology), Ex Officio: Manning (Dean of the College of Arts and Sciences) and Sparks (Dean of Graduate Studies and Research).

The university has a comprehensive program in American Studies. It begins with the general education courses on the freshman and sophomore levels, includes a major for juniors and seniors, and also provides for graduate work on the M.A. and Ph.D. levels. (For information concerning the graduate program, see the *Graduate School Catalog.)* The student who majors in American Studies has the advantage of being taught by specialists from various departments. Prerequisites: six hours of American history or American literature or three hours of each.

The program is intended to have generous breadth, but the danger of securing breadth without depth is offset by the requirement of an area of concentration in either English or history. The undergraduate major requires 42 semester hours (24 hours on the 300 and 400-level), consisting of courses in American Studies and in the "core" and "supporting" departments. The "core" departments offering a number of courses related to the study of American civilization are English, History, Government and Politics and Sociology. Courses may also be selected from the following "supporting" departments or programs: Anthropology, Architecture, Art, Comparative Literature, Dramatic Arts, Economics, Education, Geography, Journalism, Music, Philosophy, Psychology, Radio and Television.

A major in American Studies will follow this curriculum:

1. American Studies 426, 427 (Culture and the Arts in America) in the junior year and American Studies 436, 437 (Readings in American Studies) in the senior year.
2. Twelve hours of either American literature or history.
3. Nine hours in each of two of the three remaining "core" departments.
4. To meet the nine hour requirement in one of the "core" areas, a student, with the approval of his advisor, may substitute related courses from one of the following sequences:

Afro-American Studies. Related courses in art, English, government, history and sociology.

Comparative Culture. The study of one foreign culture. Courses must be drawn from at least two of the following fields: art, comparative literature, English, history, and a foreign language.

Creative and Performing Arts. Production, studio or technical courses in art, English, music, radio and television.

Philosophy and Fine Arts. Related courses in art, architecture, music philosophy.

Popular Arts and Mass Communications. Related courses in dramatic arts, journalism, radio and television.

Personality and Culture. Related courses in anthropology, education, psychology.
Social Sciences. Related courses in economics and geography.

AMST 426, 427 (127, 128). CULTURE AND THE ARTS IN AMERICA. (3, 3)
Prerequisite, junior standing. A study of American institutions, the intellectual and esthetic climate from the Colonial period to the present. (Lounsbury)

AMST 436, 437 (137, 138). READINGS IN AMERICAN STUDIES. (3, 3)
First and second semesters. An historical survey of American values as presented in various key writings. (Mintz)

FOR GRADUATES

See *Graduate School catalog* for course descriptions.

AMST 618 (200). INTRODUCTORY SEMINAR IN AMERICAN STUDIES. (3) (Beall)

AMST 628, 629 (201, 202). SEMINAR IN AMERICAN STUDIES. (3, 3) (Beall, Lounsbury, Mintz)

AMST 638 (251) ORIENTATION SEMINAR—MATERIAL ASPECTS OF AMERICAN CIVILIZATION. (3) (Staff)

AMST 639 (255). READING COURSE IN SELECTED ASPECTS OF AMERICAN CIVILIZATION. (3) (Staff)

AMST 799 (399). THESIS RESEARCH. (1-6) (Staff)

AMST 899 (499). DISSERTATION RESEARCH. (CR. ARRANGED) (Staff)

ANTHROPOLOGY (Division of Sociology)

Associate Professor and Director: Williams
Associate Professors: Anderson and Hoffman.
Assistant Professors: Fidelholtz and Rosen.
Lecturers: Clymer, Cosnow and Thurman.
Instructors: Ficker and Gluckman.

The Division of Anthropology offers beginning and advanced course work in the four principal subdivisions of the discipline: physical anthropology, linguistics, archaeology and ethnology. Courses in these subdivisions may be used to fulfill the minor or "supporting courses" requirement in some programs leading to the B.A. degree. They also may, at the discretion of the Department of Sociology, be counted toward a major in Sociology.

Anthropology Major: The fulfillment of the requirements for a major in anthropology leads to the B.A. degree. All majors are required to take 30 hours in anthropology, 18 of which must be selected from the following courses: ANTH 101, 102, 401, 441, or 451, 371 or 461, and 397. It should be noted, however, that if ANTH 101 is used to satisfy the General Education requirement in Social Science, it may not be counted as a part of the 30 required semester hours for the major. The 18 hours of required courses insures that the major becomes familiar with all areas of anthropology. No one area therefore, receives special emphasis, for it is believed that such specialization should occur during graduate study, preferably at the Ph.D. level. Thus the student is broadly prepared in the ways man has evolved culturally and physically. A statement of course requirements and recommended sequences of courses is available in the departmental office.

No course with a grade of less than C may be used to satisfy major requirements.

ANTH 101 or its equivalent, or permission of the instructor, is prerequisite to all other courses in Anthropology.

ANTH 101 (001). INTRODUCTION TO ANTHROPOLOGY: ARCHEOLOGY AND PHYSICAL ANTHROPOLOGY. (3)
May be taken for credit in the General Education Program. General patterns of the development of human culture; the biological and morphological aspects of man viewed in his cultural setting. (Staff)

ANTH 102 (002). INTRODUCTION TO ANTHROPOLOGY: CULTURAL ANTHROPOLOGY AND LINGUISTICS. (3)
Social and cultural principles as exemplified in ethnographic descriptions. The study of language within the context of Anthropology. (Staff)

ANTH 221 (021). MAN AND ENVIRONMENT. (3)
A geographical introduction to ethnology, emphasizing the relations between cultural forms and natural environment. (Anderson, Thurman)

ANTH 241 (041). INTRODUCTION TO ARCHEOLOGY. (3)
A survey of the basic aims and methods of archeological field work and interpretation, with emphasis on the reconstruction of prehistoric ways of life. (Clymer, Thurman)

ANTH 261 (061). INTRODUCTION TO PHYSICAL ANTHROPOLOGY. (3)
The biological evolution of man, including the process of race formation, as revealed by the study of the fossil record and observation of modern forms. (Rosen)

ANTH 271 (071). LANGUAGE AND CULTURE. (3)
A non-technical introduction to linguistics, with special consideration of the relations between language and other aspects of culture. (Listed also as LING 101). (Fidelholtz)

ANTH 371 (171). INTRODUCTION TO LINGUISTICS. (3)
Introduction to the basic concepts of modern descriptive linguistics. Phonology, morphology, syntax. Examinations of the methods of comparative linguistics, internal reconstruction, dialect geography. Listed also as ENGL 280 and LING 100. (Fidelholtz)

ANTH 389 (191). RESEARCH PROBLEMS. (1-6)
Prerequisite, permission of instructor. Introductory training in anthropological research methods. The student will prepare a paper embodying the results of an appropriate combination of research techniques applied to a selected problem in any field of anthropology. (Staff)

ANTH 397 (198). ANTHROPOLOGICAL THEORY. (3)
Prerequisite, permission of instructor. A survey of the historical development and current emphasis in the theoretical approaches of all fields of anthropology, providing an integrated frame of reference for the discipline as a whole. (Cosnow, Thurman, Williams)

ANTH 401 (101). CULTURAL ANTHROPOLOGY: PRINCIPLES AND PROCESSES. (3)
Prerequisite, ANTH 101, 102, or 221. An examination of the nature of human culture and its processes, both historical and functional. The approach will be topical and theoretical rather than descriptive. (Staff)

ANTH 402 (102). CULTURAL ANTHROPOLOGY: WORLD ETHNOGRAPHY. (3)
Prerequisite, ANTH 101, 102, or 221. A descriptive survey of the culture areas of the world through an examination of the ways of selected representative societies. (Staff)

ANTH 412 (112). PEOPLES AND CULTURES OF OCEANIA. (3)
A survey of the cultures of Polynesia, Micronesia, Melanesia and Australia. Theoretical and cultural-historical problems will be emphasized. (Anderson)

ANTH 414 (114). ETHNOLOGY OF AFRICA. (3)
Prerequisites, ANTH 101 and 102. The native peoples and cultures of Africa and their historical relationships, with emphasis on that portion of the continent south of the Sahara. (Cosnow)

ANTH 417 (118). PEOPLES AND CULTURES OF THE FAR EAST. (3)
A survey of the major sociopolitical systems of China, Korea and Japan. Major anthropological questions will be dealt with in presenting this material. (Staff)

ANTH 423 (123). ETHNOLOGY OF THE SOUTHWEST. (3)
Prerequisites, ANTH 101 and 102. Culture history, economic and social institutions, religion, and mythology of the Indians of the southwest United States. (Anderson, Williams)

ANTH 424 (124). ETHNOLOGY OF NORTH AMERICA. (3)
Prerequisites, ANTH 101 and 102. The native people and cultures of North America north of Mexico and their historical relationships, including the effects of contact with European-derived populations. (Anderson, Hoffman, Thurman)

ANTH 426 (126). ETHNOLOGY OF MIDDLE AMERICA. (3)
Prerequisites, ANTH 101 and 102. Cultural background and modern social, economic and religious life of Indian and mestizo groups in Mexico and Central America; processes of acculturation and currents in cultural development. (Williams)

ANTH 431 (131). SOCIAL ORGANIZATION OF PRIMITIVE PEOPLES. (3)
Prerequisites, ANTH 101 and 102. A comparative survey of the structures of non-literate and folk societies, covering both general principles and special regional developments. (Cosnow)

ANTH 434 (134). RELIGION OF PRIMITIVE PEOPLES. (3)
Prerequisites, ANTH 101 and 102. A survey of the religious systems of primitive and folk societies, with emphasis on the relation of religion to other aspects of culture. (Anderson)

ANTH 436 (136). PRIMITIVE TECHNOLOGY AND ECONOMY. (3)
A survey of technology, food economy and general economic processes in non-industrial societies. (Anderson, Hoffman, Thurman, Williams)

ANTH 437 (138). POLITICS AND GOVERNMENT IN PRIMITIVE SOCIETY. (3)
A combined survey of politics in human societies and of important anthropological theories concerning this aspect of society. (Cosnow, Williams)

ANTH 441 (141). ARCHAEOLOGY OF THE OLD WORLD. (3)
Prerequisite, ANTH 101 or 241. A survey of the archae-

ological materials of Europe, Asia and Africa, with emphasis on chronological and regional interrelationships. (Thurman)

ANTH 451 (151). ARCHAEOLOGY OF THE NEW WORLD. (3) Prerequisite, ANTH 101 or 241. A survey of the archaeological materials of North and South America with emphasis on chronological and regional interrelationships. (Clymer, Thurman)

ANTH 461 (161). ADVANCED PHYSICAL ANTHROPOLOGY. (3) Prerequisite, ANTH 101 or 261. A technical introduction to the hereditary, morphological, physiological, and behavioral characteristics of man and his primate ancestors and relatives, with emphasis on evolutionary processes. (Rosen)

ANTH 498 (192). FIELD METHODS IN ETHNOLOGY. (1-6) Field training in the collection and recording of ethnological data. (Summer only) (Cosnow, Williams)

ANTH 499 (194) FIELD METHODS IN ARCHAEOLOGY (1-6) Field training in the techniques of archaeological survey and excavation. (Summer only). (Clymer, Thurman)

FOR GRADUATES

See *Graduate School catalog* for course descriptions.

ANTH 605 (205). THEORY OF CULTURAL ANTHROPOLOGY. (3) (Hoffman, Williams)

ANTH 621 (221). CULTURAL ECOLOGY. (3) (Anderson, Clymer, Thurman)

ANTH 631 (231). EVOLUTION IN SOCIAL INSTITUTIONS. (3) (Clymer, Cosnow, Williams)

ANTH 637 (238). POLITICAL POWER AND ORGANIZATION. (3) (Cosnow, Williams)

ANTH 641 (241). METHOD AND THEORY IN ARCHAEOLOGY. (3) (Clymer, Thurman)

ANTH 661 (261). HUMAN MORPHOLOGY. (3) (Rosen)

ANTH 681 (281). PROCESSES OF CULTURE CHANGE. (3) (Cosnow)

ANTH 685 (285). PEASANT COMMUNITIES IN THE MODERN WORLD. (3) (Williams)

ANTH 688 (287). CURRENT DEVELOPMENTS IN ANTHROPOLOGY. (3) (Staff)

ANTH 689 (291). SPECIAL PROBLEMS IN ANTHROPOLOGY. (1-6) (Staff)

ANTH 698 (292). ADVANCED FIELD TRAINING IN ETHNOLOGY. (1-6) (Williams)

ANTH 699 (294). ADVANCED FIELD TRAINING IN ARCHAEOLOGY. (1-6) (Clymer, Thurman)

Other departments and programs offer courses which may be of interest to the student. See course listings under AASP, ARTH, ECON, EDHD, FMCD, GEOG, GEOL, GVPT, HIST, LING, NUTR, TXCL, PHIL, PSYC, SOCY, and ZOOL.

ART

Professor and Chairman: Levitine.
Professors: A. de Leiris, Lembach, Lynch, Maril.
Associate Professors: Bunts, Denny, Jamieson, Longley, McWhinnie, Rearick, Stites.
Assistant Professors: Dillinger, Forbes, Freeny, Isen, Mirolli, Niese, Pemberton.
Lecturers: Campbell, Farquhar, Griffin, Hommel, Jordan, Kahn, Landgren, Simkin, Withers.
Instructors: M. de Leiris, Gelman, Green, Klank, Lewis, Reid.

Two majors are offered in art: art history and studio. The student who majors in art history is committed to the study and scholarly interpretation of existing works of art, from the prehistoric era to our times, while the studio major stresses the student's direct participation in the creation of works of art.

In spite of this difference, both majors are rooted in the concept of art as a humanistic experience, and share an essential common aim: the development of aesthetic sensitivity, understanding and knowledge. For this reason, students in both majors are required to progress through a "common curriculum," which will ensure a broad grounding in both aspects of art; then each student will move into a "specialized curriculum" with advanced courses in his own major.

The curriculum leading to a degree in art education is offered in the College of Education with the cooperation of the Department of Art.

COMMON CURRICULUM

(Courses required in Major unless taken as part of supporting area as listed below.)

ARTH 100. Introduction to Art. (3)
ARTH 260. History of Art. (3)
ARTH 261. History of Art. (3)
ARTS 100. Design I. (3)
ARTS 110. Drawing I. (3)

SPECIALIZED CURRICULUM

ART HISTORY MAJOR A

5 junior-senior level History of Art courses (one each from 3 of the following areas: Ancient-Medieval, Renaissance-Baroque, 19th-20th century, non-Western). (15)

1 additional Studio Art course. (3)

Supporting Area (from any Arts and Sciences area except Art):

4 courses, 2 of which, taken in one department, must be at junior-senior level. (12)

ART HISTORY MAJOR B

5 junior-senior level History of Art courses (one each from 3 of the following areas: Ancent-Medieval, Renaissance-Baroque, 19th-20th century, non-Western). (15)

3 additional courses in any level History of Art. (9)

Supporting Area in Studio Art

ARTS 110. Design I (from Common Curriculum).
ARTS 110. Drawing I (from Common Curriculum).
2 Studio Art courses at junior-senior level. (6)

Total required credit hours, combined major and supporting area—45.

Additional history of art or studio courses may be applied; total combined art hours may not exceed 42 in Major A, or 54 in combined major and supporting area in major B.

STUDIO ART MAJOR A

ARTS 200. Intermediate Design. (3)
ARTS 210. Drawing II. (3)
ARTS 220. Painting I. (3)
ARTS 310. Drawing III. (3)
ARTS 330. Sculpture I. (3)
ARTS 340. Printmaking I. (3)

1 additional junior-senior level studio course. (3)
1 advanced History of Art course. (3)

Supporting Area (from any Arts and Sciences area except Art).

4 courses, 2 of which, taken in one department, must be at junior-senior level. (12)

STUDIO ART MAJOR B

ARTS 200. Intermediate Design. (3)
ARTS 210. Drawing II. (3)
ARTS 220. Painting I. (3)
ARTS 310. Drawing III. (3)
ARTS 330. Sculpture I. (3)
ARTS 340. Printmaking I. (3)

1 additional junior-senior level Studio Art course. (3)

Supporting Area in History of Art.

ARTH 260. History of Art (from Common Curriculum).

ARTH 261. History of Art (from Common Curriculum).

2 History of Art courses at junior-senior level. (6)

Total required credit hours, combined major and supporting Area—51 in major A, 42 in major B.

No course with a grade less than C may be used to satisfy major requirements.

ART EDUCATION

ARTE 100 (040). FUNDAMENTALS OF ART EDUCATION. (3)
Two hours of laboratory and two hours of lecture per week. Fundamental principles of the visual arts for teaching on the elementary level. Elements and principles of design and theory of color. Studio practice in different media. (Staff)

FOR GRADUATES

See the Graduate School catalog for description.

ARTE 600, 601 (240, 241). ADVANCED PROBLEMS IN ART EDUCATION. (3, 3) (Staff)

ARTE 799 (399). THESIS RESEARCH. (1-6) (Staff)

HISTORY OF ART

ARTH 100 (010). INTRODUCTION TO ART. (3)
Basic tools of understanding visual art. This course stresses major approaches such as techniques, subject matter, form, and evaluation. Architecture, sculpture, painting, and graphic arts will be discussed. Required of all Art majors in the first year. (Staff)

ARTH 260, 261 (060, 061). HISTORY OF ART. (3, 3)
A survey of western art as expressed through architecture, sculpture and painting. First semester, prehistoric times to Renaissance; second semester from Renaissance to the present. (Staff)

ARTH 284 (062). INTRODUCTION TO AFRICAN ART. (3)
A study of West and Central African art with emphasis on inter-tribal relationships as demonstrated by their sculptural styles. (Hommel)

ARTH 320, 321 (065, 066). MASTERPIECES OF PAINTING. (3, 3)
A study of the contributions of a few major painters, ranging from Giotto to Picasso. (Levitine)

ARTH 330, 331 (067, 068). MASTERPIECES OF SCULPTURE. (3, 3)
A study of the contributions of a few major sculptors, ranging from Polykleitos to Moore. (Mirolli)

ARTH 340, 341 (070, 071). MASTERPIECES OF ARCHITECTURE. (3, 3)
A study of great architecture from Stonehenge to Dulles Airport. (Stites)

ARTH 402, 403 (160, 161). CLASSICAL ART. (3, 3)
Architecture, sculpture and painting in the Classical cultures. First semester will stress Greece; second semester, Rome. (Pemberton)

ARTH 404 (181). BRONZE AGE ART. (3)
Art of the Near East, Egypt and Aegean. (Pemberton)

ARTH 406, 407 (162, 163). ART OF THE EAST. (3, 3)
Architecture, sculpture and painting. First semester will stress India; second semester, China and Japan. (Griffin)

ARTH 410 (164). EARLY CHRISTIAN AND BYZANTINE ART. (3)
Architecture, sculpture, painting, and mosaic of Early Christian Rome, the Near East and the Byzantine Empire. (Staff)

ARTH 412, 413 (166, 167). MEDIEVAL ART. (3, 3)
Architecture, sculpture and painting in the Middle Ages. First semester will stress Romanesque; second semester, the Gothic period. (Denny)

ARTH 416, 417 (170, 171). NORTHERN EUROPEAN PAINTING IN THE 15TH AND 16TH CENTURIES. (3, 3)
Painting in the Netherlands, France and Germany. (Farquhar)

ARTH 422, 423 (168, 169). RENAISSANCE ART IN ITALY. (3, 3)
Architecture, sculpture and painting from 1400 to the High Renaissance in the 16th century. (Rearick)

ARTH 430, 431 (172, 173). EUROPEAN BAROQUE ART. (3, 3)
Architecture, sculpture and painting of the major European centers in the 17th century. (Staff)

ARTH 434, 435 (174, 175). FRENCH PAINTING. (3, 3)
French painting from the 15th through the 18th century, from Fouquet to David. (Levitine)

ARTH 440, 441 (176, 177). 19TH CENTURY EUROPEAN ART. (3, 3)
Architecture, sculpture and painting in Europe from Neo-Classicism to Impressionism. (de Leiris)

ARTH 445 (180). IMPRESSIONISM AND NEO-IMPRESSIONISM. (3)
Prerequisite, ARTH 260, 261 or consent of instructor. History of Impressionism and Neo-Impressionism: artists, styles, art theories, criticism, sources and influence on 20th century. (de Leiris)

ARTH 450, 451 (178, 179). 20TH CENTURY ART. (3, 3)
Architecture, sculpture and painting from the late 19th century to our day. (Withers)

ARTH 455 (182). 20TH CENTURY MASTERS AND MOVEMENTS. (3)
Artists and tendencies in 20th century art. Subject will change and be announced each time course is offered. (Withers)

ARTH 460 (184). HISTORY OF THE GRAPHIC ARTS. (3)
Prerequisite, ARTH 100, or ARTH 260 and 261, or consent of instructor. Graphic techniques and styles in Europe from 1400 to 1800; contributions of major artists. (Staff)

ARTH 470, 471 (152, 153). LATIN AMERICAN ART. (3, 3)
Art from the pre-Columbian civilization to the modern period. (Lynch)

ARTH 474, 475 (150, 151). SPANISH ART. (3, 3)
Special emphasis will be given to the artists of the 16th and 17th centuries such as El Greco and Velasquez. (Lynch)

ARTH 476, 477 (158, 159). HISTORY OF AMERICAN ART. (3, 3)
Architecture, sculpture and painting in the United States from the Colonial period to the present. (Jordan)

ARTH 480 (155). AMERICAN COLONIAL PAINTING. (3)
Development and style of painting in Colonial America: sources, genres, influential studios, Anglo-American School of historical painting. (Jordan)

ARTH 482 (157). AMERICAN ART AND ITS RELATIONSHIP TO EUROPE: 1800-1900. (3)
Prerequisite, ARTH 476 and 477 recommended. The American artist in Europe; American and German Romanticism; Neo-Classicism in America and Europe; Düsseldorf School; Munich School; Pre-Raphaelites, Barbizon School and Impressionism. (Jordan)

ARTH 489 (196). SPECIAL TOPICS IN ART HISTORY: As announced.(3)
Prerequisite, consent of Department Chairman or instructor. (Staff)

ARTH 498, 499 (194, 195). DIRECTED STUDIES IN ART HISTORY. (2 or 3, 2 or 3)
For advanced students, by permission of Department Chairman. Course may be repeated for credit if content differs. (Staff)

FOR GRADUATES

The requirements of students will determine which courses will be offered. See the Graduate School catalog for descriptions.

ARTH 612 (274). ROMANESQUE ART. (3) (Denny)

ARTH 614 (276). GOTHIC ART. (3) (Denny)

ARTH 630 (259). THE ART OF MANNERISM. (3) (Lynch)

ARTH 634 (260). FRENCH PAINTING FROM LEBRUN TO GERICAULT, 1715-1815. (3) (Levitine)

ARTH 656 (264). 19TH CENTURY REALISM, 1830-1860. (3) (de Leiris)

ARTH 662 (267). 20TH CENTURY EUROPEAN ART. (3) (Withers)

ARTH 672 (250). AMERICAN COLONIAL ART. (3) (Jordan)

ARTH 676 (256). 20TH CENTURY AMERICAN ART. (3) (Withers)

ARTH 692 (280). METHODS OF ART HISTORY. (3) (Landgren)

ARTH 694, 695 (282, 283). MUSEUM TRAINING PROGRAM. (3, 3) (Landgren)

ARTH 698 (294). DIRECTED GRADUATE STUDIES IN ART HISTORY. (3) (Staff)

ARTH 699 (296). SPECIAL TOPICS IN ART HISTORY. (3) (Staff)

ARTH 702 (269). SEMINAR IN CLASSICAL ART. (3) (Pemberton)

ARTH 712 (270). SEMINAR IN MEDIEVAL ART. (3) (Denny)

ARTH 714 (272). SEMINAR. PROBLEMS IN MEDIEVAL ICONOGRAPHY. (3) (Denny)

ARTH 728 (277). SEMINAR TOPICS IN ITALIAN RENAISSANCE ART: As Announced. (Rearick)

ARTH 736 (262). SEMINAR IN 18TH CENTURY EUROPEAN ART. (3) (Levitine)

ARTH 740 (261). SEMINAR IN ROMANTICISM. (3) (Levitine)

ARTH 743 (263). SEMINAR IN 19TH CENTURY EUROPEAN ART. (3) (de Leiris)

ARTH 754 (265). SEMINAR IN POST-IMPRESSIONISM AND SYMBOLISM. (3) (de Leiris)

ARTH 760 (266). SEMINAR IN CONTEMPORARY ART. (3) (Withers)

ARTH 770 (286). SEMINAR IN LATIN-AMERICAN ART. (3) (Lynch)

ARTH 772 (288). SEMINAR IN MODERN MEXICAN ART. (3) (Lynch)

ARTH 774 (255). SEMINAR IN 19TH CENTURY AMERICAN ART. (3) (Jordan)

ARTH 776 (257). SEMINAR IN AMERICAN ART AND ITS LITERARY SOURCES. (3) (Jordan)

ARTH 777 (258). SEMINAR IN LOCAL AND REGIONAL ART. (3) (Jordan)

ARTH 780 (284). SEMINAR. PROBLEMS IN ARCHITECTURAL HISTORY AND CRITICISM. (3) (Staff)

ARTH 784 (268). SEMINAR IN LITERARY SOURCES OF ART HISTORY. (3) (Levitine)

ARTH 798 (295). DIRECTED GRADUATE STUDIES IN ART HISTORY. (3) (Staff)

ARTH 799 (399). MASTER'S THESIS RESEARCH. (1-6 var. cr.) (Staff)

ARTH 899 (499). DOCTORAL THESIS RESEARCH. (Credit arranged.) (Staff)

STUDIO ART

ARTS 100 (012). DESIGN I. (3)
Six hours per week. Principles and elements of design through manipulation and organization of materials in two and three dimensions. (Green, Staff)

ARTS 110 (016). DRAWING I. (3)
Six hours per week. An introductory course with a variety of media and related techniques. Problems based on still life, figure and nature. (Niese, Staff)

ARTS 200 (022). INTERMEDIATE DESIGN. (3)
Six hours per week. Prerequisites ARTS 100, 110. A continuation of Design I with more individually structured problems. (Staff)

ARTS 210 (026). DRAWING II. (3)
Six hours per week. Prerequisites, ARTS 100, 110. Original compositions from the figure and nature, supplemented by problems of personal and expressive drawing. (Staff)

ARTS 220 (017). PAINTING I. (3)
Six hours per week. Prerequisites ARTS 100, 110. Basic tools and language of painting. Oil and watercolor. (Staff)

ARTS 277 (027). ARCHITECTURAL PRESENTATION. (3)
Six hours per week. Prerequisites, ARTS 100, 110. Techniques of wash and watercolor in architectural, interior and landscape architectural rendering. (Stites)

ARTS 310 (126). DRAWING III. (3)
Six hours per week. Prerequisite, ARTS 210. Emphasis on understanding organic form, as it is related to study from the human figure and to pictorial composition. (Staff)

ARTS 320 (117). PAINTING II. (3)
Six hours per week. Prerequisites, ARTS 210, 220. Orlginal compositions based upon nature, figure and still life, supplemented by expressive painting. Choice of media. Different sections of course may be taken for credit.
320A. Oil painting and related media.
320B. Watercolor and casein.
320C. Plastic media, such as encaustic and polymer tempera.
320D. Mural painting. The use of contemporary synthetic media. (Staff)

ARTS 324 (127). PAINTING III. (3)
Six hours per week. Prerequisite, ARTS 320. Creative painting for advanced students. Problems require a knowledge of pictorial structure. Development of personal direction. Choice of media. (Staff)

ARTS 330 (118). SCULPTURE I. (3)
Six hours per week. Prerequisite, ARTS 210. (For students majoring in Art History, by permission of department.) Volumes, masses and planes, based on the use of plastic earths. Simple armature construction and methods of casting. (Staff)

ARTS 334 (128A). SCULPTNRE II. (3)
Six hours per week. Prerequisite, ARTS 330. Nature as a point of reference with potentiality of developing ideas into organic and architectural forms. (Staff)

ARTS 335 (128B). SCULPTURE III. (3)
Six hours per week. Prerequisite, ARTS 334. Problems involving plastic earths and other material capable of

being modeled or cast. Choice of individual style encouraged. (Freeny)

ARTS 340 (119). PRINTMAKING I. (3)
Six hours per week. Prerequisite, ARTS 210. (For students majoring in Art History, by permission of department.) Basic printmaking techniques in relief, intaglio, and planographic media. (Forbes, Isen)

ARTS 344 (129). PRINTMAKING II. (3)
Six hours per week. Prerequisite, ARTS 210. One print media including extensive study of color processes. Individually structured problems. (Forbes, Isen)

ARTS 410 (136). DRAWING IV. (3)
Six hours per week. Prerequisite, ARTS 310. Advanced drawing, with emphasis on human figure, its structure and organic likeness to forms in nature. Compositional problems deriving from this relationship are also stressed. (Jamieson)

ARTS 420 (137). PAINTING IV. (3)
Six hours per week. Prerequisite, ARTS 324. Creative painting. Emphasis on personal direction and self-criticism. Group seminars. (Staff)

ARTS 430 (138). SCULPTURE IV. (3)
Six hours per week. Prerequisite, ARTS 335. Problems and techniques of newer concepts, utilizing various materials, such as plastics and metals. Technical aspects of welding stressed. (Freeny)

ARTS 440 (139A). PRINTMAKING III. (3)
Six hours per week. Prerequisite, ARTS 340 and 344 Contemporary experimental techniques of one print medium with group discussions. (Forbes, Isen)

ARTS 441 (139B). PRINTMAKING IV. (3)
Six hours per week. Prerequisite, ARTS 440. Continuation of ARTS 440. (Forbes, Isen)

ARTS 498 (192). DIRECTED STUDIES IN STUDIO ART. (2 or 3)
For advanced students, by permission of department chairman. Course may be repeated for credit if content differs. (Staff)

FOR GRADUATES

The requirements of students will determine which courses will be offered. See the *Graduate School catalog* for descriptions.

ARTS 610 (226). DRAWING. (3) (Staff)

ARTS 614 (227). DRAWING. (3)

ARTS 616 (228). DRAWING. (3)

ARTS 620 (200). PAINTING. (3)

ARTS 624 (201). PAINTING. (3)

ARTS 626, 627 (202, 203). PAINTING. (3, 3)

ARTS 630 (221). EXPERIMENTATION IN SCULPTURE. (3)

ARTS 634 (222). EXPERIMENTATION IN SCULPTURE. (3)

ARTS 636 (223). MATERIALS AND TECHNIQUES IN SCULPTURE. (3)

ARTS 637 (224). SCULPTURE—CASTING AND FOUNDRY. (3)

ARTS 640 (211). PRINTMAKING. (3)

ARTS 644 (212). PRINTMAKING. (3)

ARTS 646 (213). PRINTMAKING. (3)

ARTS 647 (214). SEMINAR IN PRINTMAKING. (3)

ARTS 690 (229). DRAWING AND PAINTING. (3)

ARTS 698 (292). DIRECTED GRADUATE STUDIES IN STUDIO ART. (3)

ARTS 798 (293). DIRECTED GRADUATE STUDIES IN STUDIO ART. (3)

ARTS 799 (399). THESIS RESEARCH. (1-6 var. cr.)

ASTRONOMY

Professor and Chairman of Physics and Astronomy: Laster.

Professor and Director of Astronomy: Westerhout.

Professors: Brandt (P.T.), Erickson, Kerr, Kundu, Musen (P.T.), Opik.

Associate Professors: Bell, Matthews, Smith, Wentzel, Zipoy.

Assistant Professors: A'Hearn, Harrington, Simonson, Zuckerman.

The Department of Physics and Astronomy offers a major in Astronomy. The Astronomy Program office is located in the Space Sciences Building. Astronomy students are given a strong undergraduate preparation in astronomy, physics and mathematics, as well as encouragement to take a wide range of other liberal arts courses. The Astronomy Program is designed to be quite flexible, in order to take advantage of students' special talents or interests after the basic requirements for a sound astronomy education have been met. Students preparing for graduate studies will have an opportunity to choose from among many advanced courses available in astronomy, mathematics and physics. The program is designed to prepare students for graduate work as well as for positions in governmental and industrial laboratories and observatories.

Students intending to major in astronomy who have had a high school course in physics, and who have adequate preparation in mathematics to qualify for admission to MATH 140 will ordinarily take the introductory physics courses PHYS 181, 182, 283 and 284, during their freshman and sophomore years. Those students who do not decide to major in astronomy or physics until after their freshman or sophomore year or enter as transfer students will often have taken other introductory courses in physics (i.e. PHYS 161, 262, 263). Students will find recommended course programs in the pamphlet entitled *Department Requirements for a B.S. degree in Astronomy* which is available from the Astronomy Program Office. This pamphlet outlines many different approaches for an astronomy major.

ASTR 180 (Descriptive and Analytical Astronomy) is the introductory astronomy course required of astronomy majors. It may be taken in the freshman or sophomore year. It is followed by another required course, ASTR 210 (Practical Astronomy). Occasionally a student may not decide to major in astronomy until after he has already taken ASTR 100 and 105 (Introduction to Astronomy and Modern Astronomy). These courses together may be substituted for the ASTR 180 requirement, but only students with a grade of B or better in ASTR 100 and 105 will be encouraged to major in astronomy. Such students must also take ASTR 210.

REQUIRED COURSES FOR ASTRONOMY MAJOR

(a) Introductory Physics Courses. PHYS 181, 182--Introductory Physics, Mechanics, Fluids, Heat and Sound (4,4) followed by PHYS 283—Introductory Physics, Electricity and Magnetism (4) and PHYS 284—Introductory Physics, Optics and Modern Physics (4) (Total 16 credits); or PHYS 161, 262, 263—General Physics (3,4,4) and PHYS 404—Intermediate Theoretical Mechanics (3) and PHYS 405—Intermediate Theoretical Electricity and Magnetism (3).

(b) Physics Laboratory. At least four credits of laboratory courses: ordinarily PHYS 285, 286, but 365, 485 may be added.

(c) Modern Physics, PHYS 421, 422 (3, 3) or Mathematical Physics, PHYS 410, 411 (4, 4).

(d) Supporting Courses. MATH 115, 140, 240—Analysis (4, 4, 4)
(Astronomy majors are encouraged to enter the accelerated math sections which cover these courses in two terms.) These must be followed by at least one additional 3 or 4 credit mathematics course approved by the astronomy advisor. Recommended courses are MATH 241—Calculus (4), MATH 246—Differential Equations for Scientists and Engineers (3), MATH 462, 463—Analysis for Scientists and Engineers (3, 3), MATH 413—Introduction to Complex Variables (4), MATH 410—Advanced Calculus (4), or MATH 460—Numerical Methods (3). (Minimum 15 credits).

(e) Introductory Astronomy Courses. Normally ASTR 180 and 210.
ASTR 100 and 105 may be substituted for ASTR 180 (See above).

(f) Advanced Astronomy Courses. Two Astronomy courses at the 400 level. (Minimum 6 credits).

Students may major in Astronomy only if a grade of C is attained in each semester of the introductory physics and astronomy courses. Any student who wishes to be recommended for graduate work in astronomy must maintain a B average and should also consider including some or all of the following courses in his program in addition to those required of all astronomy majors:

(a) Astronomy. One or more additional courses at the 400 level.

(b) Physics. Both PHYS 410, 411 (4, 4)—Mathematical Physics and PHYS 421, 422 (3, 3)—Modern Physics; and one or more of those listed below.

(c) Supporting courses. One or two additional mathematics or computer science courses, selected in consultation with the advisor.

Further physics courses that astronomy majors should consider, both those terminating at the B.S. and those planning graduate studies, are the following:

PHYS 365. ADVANCED EXPERIMENTS.
PHYS 412. KINETIC THEORY OF GASES.
PHYS 413. ADVANCED THEORETICAL PHYSICS.
PHYS 414. THERMODYNAMICS AND STATISTICAL MECHANICS.
PHYS 423. ELEMENTARY QUANTUM PHYSICS.
PHYS 451. INTRODUCTION TO ELEMENTARY PARTICLES.
PHYS 463. INTRODUCTION TO PLASMA PHYSICS.
PHYS 471. INTRODUCTION TO ATMOSPHERIC AND SPACE PHYSICS.

HONORS IN ASTRONOMY

The Honors Program offers to students of exceptional ability and interest in astronomy an educational program with a number of special opportunities for learning. Honors sections are offered in several courses, and there are many opportunities for part-time research participation which may develop into full-time summer projects. An honors seminar is offered for advanced students; credit may be given for independent work or study; and certain graduate courses are open for credit toward the bachelor's degree.

Students for the Honors Program are accepted by the Department's Honors Committee on the basis of recommendations from their advisors and other faculty members. A final written and oral comprehensive examination in the senior year concludes the program which may lead to graduation "with Honors (or High Honors) in Astronomy."

ASTR 100 (001). INTRODUCTION TO ASTRONOMY. (3)
Every semester. An elementary course in descriptive astronomy, especially appropriate for non-science students. Sun, moon, planets, stars and nebulae, galaxies, evolution. The course is illustrated with slides and demonstrations of instruments.
(Frey, Westerhout, Wentzel, Kerr, Smith)

ASTR 105 (002). INTRODUCTION TO MODERN ASTRONOMY. (3)
Three lectures per week. Prerequisite, ASTR 100. An elementary course in modern astronomy elaborating on some of the topics which could only be mentioned briefly in ASTR 100. Appropriate for non-science students.
(Kundu, Erickson)

ASTR 110 (005). ASTRONOMY LABORATORY. (1)
Fall and spring semesters. Two hours of laboratory per week. Prerequisite, previous or concurrent enrollment in ASTR 100 or 180. Exercises in the use of celestial coordinates, measurement of position, determination of time of day and night; study of photographs of stars, nebulae and galaxies, and spectra; photoelectric photometry; demonstration of astronomical instruments, daytime and nighttime observations if weather permits. Appropriate for non-science majors. (Smith, Matthews, A'Hearn)

ASTR 180 (010). DESCRIPTIVE AND ANALYTICAL ASTRONOMY. (3)
Fall semester. Three lectures per week. A general survey course intended for science majors. Prerequisite, MATH 115 or equivalent; a knowledge of trigonometry and logarithms will be assumed. This introductory course will deal with the sun and the solar system, stars and astrophysics, stellar systems and cosmology. It should not be taken by students who have already taken ASTR 100 and 105. (Harrington, Kundu)

ASTR 210 (025). PRACTICAL ASTRONOMY. (2-3)
Prerequisites: ASTR 180 and MATH 140. ASTR 100 and 105 may be substituted for ASTR 180 if approved by instructor. One lecture and one two-hour laboratory

per week. 2-3 credits, according to work done. This course is designed primarily for astronomy majors and will give the student familiarity with techniques used by astronomers and an understanding of how astronomical data are obtained. Students registered for 2 credits will not be required to do all the exercises. Topics will include coordinate systems, optics, photometry, binary stars, distance determinations, Hertzsprung-Russell diagram, solar observations, moon, galactic structure and galaxies. (Smith, Matthews)

ASTR 399 (190). HONORS SEMINAR.
Credit according to work done; each semester. Enrollment is limited to students admitted to the Honors Program in Astronomy. (Staff)

ASTR 400 (102). INTRODUCTION TO ASTROPHYSICS I. (3)
Three lectures per week. Pre- or corequisite, PHYS 422 or consent of instructor. Spectroscopy, structure of the atmospheres of the sun and other stars. Observational data and curves of growth. Chemical composition. (Harrington, Zipoy)

ASTR 401 (103). INTRODUCTION TO ASTROPHYSICS II. (3)
Three lectures per week. Prerequisite, ASTR 400. A brief survey of stellar structure and evolution, and of the physics of low-density gases, such as the interstellar medium and the solar atmosphere. Emphasis is placed on a good understanding of a few theoretical concepts that have wide astrophysical applications.

ASTR 410, 411 (100, 110). OBSERVATIONAL ASTRONOMY. (3, 3)
Prerequisites: working knowledge of calculus, physics through PHYS 284 or 263, and 3 credits of astronomy. An introduction to current methods of obtaining astronomical information including radio, infrared, optical, ultraviolet, and x-ray astronomy. The laboratory work will involve photographic and photoelectric observations with the department's optical telescope and 21-cm line spectroscopy, flux measurements and interferometry with the department's radiotelescopes. (A'Hearn, Erickson, Simonson)

ASTR. 420 .(101). INTRODUCTION TO GALACTIC RESEARCH. (3)
First semester. Three lectures per week. Prerequisite, MATH 240 and at least 12 credits of introductory physics and astronomy courses. Stellar motions, methods of galactic research, study of our own and nearby galaxies, clusters of stars. (Kerr, Matthews)

ASTR 450 (124). CELESTIAL MECHANICS. (3)
Three lectures a week. Prerequisite, PHYS 410 or consent of instructor. Celestial mechanics, orbit theory, equations of motion. (Musen)

ASTR 498 (150). SPECIAL PROBLEMS IN ASTRONOMY.
Given each semester. Prerequisite, major in physics or astronomy and-or consent of advisor. Research or special study. Credit according to work done. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

ASTR 600 (203). STELLAR ATMOSPHERES. (3)
ASTR 605 (202). STELLAR INTERIORS. (3)
ASTR 620 (210). GALACTIC RADIO ASTRONOMY. (3)
ASTR 625 (200). DYNAMICS OF STELLAR SYSTEMS. (3)
ASTR 630 (204). PHYSICS OF THE SOLAR SYSTEM. (3)
ASTR 660 (212). PHYSICS OF THE SOLAR ENVELOPE. (3)
ASTR 670 (214). INTERSTELLAR MATTER. (3)
ASTR 688, 788 (248, 249). SPECIAL TOPICS IN MODERN ASTRONOMY. (Cr. Arr.)
ASTR 698 (230). SEMINAR. (1)
ASTR 699 (250). SPECIAL PROBLEMS IN ADVANCED ASTRONOMY. (1-6)
ASTR 799 (399). RESEARCH. (Cr. Arr.)
ASTR 899 (499). DISSERTATION RESEARCH. (Cr. Arr.)

BIOLOGICAL SCIENCES

The program has been prepared for the student who is interested in biology but whose interest has not yet centered in any one of the biological sciences. It is suitable for the pre-dental or pre-medical student who plans to earn the B.S. degree before entering professional school. The program includes work in botany, entomology, microbiology, and zoology, and introduces the student to the general principles and methods of each of these biological sciences. The student may then emphasize one of these areas in completing his program.

By proper selection of courses during the junior and senior years, a student may concentrate his work sufficiently in one area of biology to be able to continue graduate work in that field. However, a student who is planning to do graduate work should major in one specific field of biology.

The student following this program must meet the general requirements for a degree in the College of Arts and Sciences. He should select French or German to meet the foreign language requirements.

Required introductory courses in the biological sciences: BOTN 100, ENTM 200, MICB 200, ZOOL 101. These courses must be passed with an average grade of at least C. The pre-professional student should take ZOOL 102 as well.

Required supporting courses in mathematics and physical sciences: MATH 110, 111; CHEM 103, 104; PHYS 121, 122. The student working in most areas of biology will also need the second year of Chemistry (CHEM 201-204; or 211-214.) Additional work in chemistry may also be required by the student's advisor, in accordance with the needs of the student's field of emphasis. The pre-professional student must include CHEM 201-204 or 211-214 in his program.

Advanced courses in the biological sciences: The student must complete at least 30 semester hours of advanced work selected from the fields of botany, entomology, microbiology, and zoology. Of these credits at least 18 must be at the 300 and 400 level and taken in at least two of the four departments. The following courses in psychology may be counted as part of the required 30 semester hours but may not be used to satisfy the requirement of 18 semester hours at the advanced level: PSYC 402, 403, 410, 462, 479.

A junior or senior following this curriculum will be advised by the department in which he plans to do the most work.

BOTANY

Botany is recognized as a major or minor field of study in Arts and Sciences, usually leading to the B.S. degree. To receive this degree, a student must fulfill the requirements of the Botany Department, those of the College of Arts and Sciences, and the General Studies and other University requirements. The student with a major in Botany will have a member of the botany faculty as his ad-

visor and will be enrolled in the College of Arts and Sciences.

Administratively the Botany Department is a part of the College of Agriculture. Therefore, the departmental information, requirements and course listings are listed under the College of Agriculture.

CHEMISTRY

Professor and Chairman: Vanderslice.
Professor and Associate Chairman: Jaquith.
Professors: Castellan, Grim, Henery-Logan, Keeney, Lippincott, Ponnamperuma, Pratt, Purdy, Reeve, Rollinson, Stewart, Stuntz, Svirbely, Veitch, White (Emeritus).
Visiting Professors: Breger, Reiman, Rose.
Research Professor: Bailey.
Associate Professors: Boyd, DeVoe, Gardner, Gordon, Holmlund, Huheey, Kasler, Lakshmanan, Pickard, Staley, Viola, Walters.
Assistant Professors: Ammon, Barker, Bellama, Campagnoni, Davis, Hanson, Helz, Jackson, Jarvis, Khanna, Martin, Mazzocchi, Miller, Moore, Murphy, O'Haver, Olin, Sampugna, Sommer, Zoller.
Instructor: Stuntz.
Lecturer: Heikkinen.

The science of chemistry is so broad that completion of a well-planned course of undergraduate study is necessary before specialization. The curriculum outlined below describes such a course of study. The sequence of courses given should be followed as closely as possible. All of the chemistry courses listed are required. The electives must include 4 *lecture* credits selected from two different courses (one must be in chemistry) from among CHEM 422, CHEM 441, CHEM 485, or an advanced course in mathematics or physics that has MATH 140 as a prerequisite. The electives must include CHEM 442 or CHEM 486 or CHEM 499; CHEM 499 can be elected only by students in the chemistry honors program, and must be taken in the second semester of the senior year. Further information concerning the honors program in chemistry may be obtained from the Chemistry Department Honors Committee.

FIRST YEAR

First Semester		*Second Semester*	
Chemistry 103 or 105	4	Chemistry 104 or 106	4
Mathematics 140	4	Mathematics 141	4
English 101 or 171	3	English 201	3
General Education	3	Physics 161	3
Health 105	2	Speech 107	2
Physical Education	1	Physical Education	1
	17		17

SECOND YEAR

Chemistry 201 or 211	3	Chemistry 203 or 213	3
Chemistry 202 or 212	2	Chemistry 204 or 214	2
Physics 262	4	Physics 263	4
English 202	3	General Education	3
General Education	3	Electives	3
	15		15

THIRD YEAR

Chemistry 481	3	Chemistry 482	3
Chemistry 483	1	Chemistry 484	1
German or Russian	3	Chemistry 443	2
General Education	3	German or Russian	3
Electives	5	General Education	3
	15	Electives	3
			15

FOURTH YEAR

Chemistry 421	3	Chemistry 401	3
German or Russian	3	German or Russian	3
General Education	3	Electives	9
Electives	6		
	15		15

Students who begin the mathematics sequence with MATH 115 must postpone PHYS 161, 262, and 263 one semester each. The following curriculum contains this shift and reflects other changes caused by the modification.

FIRST YEAR

First Semester		*Second Semester*	
Chemistry 103 or 105	4	Chemistry 104 or 106	4
Mathematics 115	3	Mathematics 140	4
English 101 or 171	3	English 201	3
General Education	3	General Education	3
Health 105	2	Speech 107	2
Physical Education	1	Physical Education	1
	16		17

SECOND YEAR

Chemistry 201 or 211	3	Chemistry 203 or 213	3
Chemistry 202 or 212	2	Chemistry 204 or 214	2
Mathematics 141	4	Physics 262	4
Physics 161	3	General Education	3
English 202	3	Electives	4
	15		16

THIRD YEAR

Chemistry 481	3	Chemistry 482	3
Chemistry 483	1	Chemistry 484	1
Physics 263	4	Chemistry 443	2
German or Russian	3	General Education	3
General Education	3	German or Russian	3
	14	Electives	4
			16

FOURTH YEAR

Chemistry 421	3	Chemistry 401	3
German or Russian	3	German or Russian	3
Electives	9	Electives	9
	15		15

The Department of Chemistry also offers a program leading to a B.S. with a major in Biochemistry.

FIRST YEAR

First Semester		*Second Semester*	
Chemistry 103 or 105	4	Chemistry 104 or 106	4
Mathematics 115	3	Mathematics 140	4
English 101 or 171	3	English 201	3
General Education	3	General Education	3
Health 105	2	Speech 107	2
Physical Education	1	Physical Education	1
	16		17

SECOND YEAR

Chemistry 201 or 211	3	Chemistry 203 or 213	3
Chemistry 202 or 212	2	Chemistry 204 or 214	2
Mathematics 141	4	Physics 262	4
Physics 161	3	General Education	3
English 202	3	Electives	4
	15		16

THIRD YEAR

Chemistry 481	3	Chemistry 462	3
Chemistry 483	1	Chemistry 464	1
Physics 263	4	Foreign Language	3
Foreign Language	3	General Education	3
Electives	3	Electives	6
	14		16

FOURTH YEAR

Chemistry 461	3	Chemistry 462	3
Chemistry 463	2	Chemistry 464	2
Foreign Language	3	Foreign Language	3
Electives	7	General Education	3
	15	Electives	4
			15

The student must also take at least 9 semester hours in approved biological science courses with at least one course at the 300-400 level.

CHEM 101 (006). INTRODUCTORY COLLEGE CHEMISTRY. (2)
Two lectures and one recitation per week. An introduction to the study of matter. This course is intended to be followed by CHEM 103. This course may not be taken for credit by students with credit in CHEM 001, 003, 005, 102, 103, or 105 or their equivalents. This course may not be taken to satisfy the General Education science requirement. (Staff)

CHEM 102 (007). CHEMISTRY OF MAN'S ENVIRONMENT. (4)
Three lectures and one three-hour laboratory per week. Non-mathematical presentation of basic chemical principles and applications in cosmochemistry, geochemistry, biochemistry, and nuclear chemistry. Particular emphasis is placed on the development of man's environment and his effect upon it. This course is for the general student and does not satisfy the requirements of the professional schools. (Staff)

CHEM 103 (008). COLLEGE CHEMISTRY I. (4)
Three lectures, one recitation, and one three-hour laboratory per week. Prerequisite, CHEM 101 or satisfactory performance on qualifying test. The first semester of a general chemistry sequence intended for students whose curricula require a year or more of chemistry to provide a working knowledge of the science. Nature and composition of matter; chemical calculations; atomic structure; solutions. (Staff)

CHEM 104 (009). COLLEGE CHEMISTRY II. (4)
Three lectures, one recitation, and one three-hour laboratory per week. Prerequisite, CHEM 103 or 105. A continuation of CHEM 103. The chemistry of carbon, aliphatic compounds; acids and bases, aromatic compounds; stereochemistry; halides; amines and amides; acids, esters; carbohydrates; natural products. (Staff)

CHEM 105 (018). PRINCIPLES OF COLLEGE CHEMISTRY I. (4)
Three lectures, one recitation, and one three-hour laboratory per week. A more rigorous treatment of the material of CHEM 103. Admission by invitation of the Chemistry Department based on performance on a qualifying test. (Staff)

CHEM 106 (020). PRINCIPLES OF COLLEGE CHEMISTRY II. (4)
Three lectures, one recitation, and one three-hour laboratory per week. Prerequisite, CHEM 103 or 105 and consent of the Chemistry Department. A more rigorous treatment of the material of CHEM 104. (Staff)

CHEM 201 (010). COLLEGE CHEMISTRY III. (3)
Three lectures and one recitation per week. Prerequisite, CHEM 104 or 106. A continuation of CHEM 104. Organic chemistry, with emphasis on molecular structure; stereochemistry, conformational analysis; substitution reactions; carbonium ions; spectroscopy; aromaticity; synthetic processes. This course must be accompanied by CHEM 202 unless credit for CHEM 202 has previously been established. (Staff)

CHEM 202 (012). COLLEGE CHEMISTRY LABORATORY III. (2)
One lecture and one three-hour laboratory per week. Prerequisite, CHEM 104 or 106. A laboratory course to accompany CHEM 201. This course must be accompanied by CHEM 201. (Staff)

CHEM 203 (014). COLLEGE CHEMISTRY IV. (3)
Three lectures and one recitation per week. Prerequisite, CHEM 104 or 106. Introductory analytical and theoretical chemistry. Bonding theory; electrochemistry; molecular energetics and structure; chemical dynamics; equilibrium; determination of composition of matter. This course must be accompanied by CHEM 204 unless credit for CHEM 204 has previously been established. (Staff)

CHEM 204 (016). COLLEGE CHEMISTRY LABORATORY IV. (2)
One lecture and one three-hour laboratory per week. Prerequisite, CHEM 104 or 106. A laboratory course to accompany CHEM 203. This course must be accompanied by CHEM 203. (Staff)

CHEM 211 (022). PRINCIPLES OF COLLEGE CHEMISTRY III. (3)
Three lectures and one recitation per week. Prerequisite, CHEM 104 or 106 and consent of the Chemistry Department. A more rigorous treatment of the material of CHEM 201. This course must be accompanied by CHEM 212 unless credit for CHEM 212 has previously been established. (Staff)

CHEM 212 (024). PRINCIPLES OF COLLEGE CHEMISTRY LABORATORY III. (2)
One lecture and one three-hour laboratory per week. Prerequisite, CHEM 104 or 106 and consent of the Chemistry Department. A more rigorous treatment of the material of CHEM 202. This course must be accompanied by CHEM 211. (Staff)

CHEM 213 (025). PRINCIPLES OF COLLEGE CHEMISTRY IV. (3)
Three lectures and one recitation per week. Prerequisite, CHEM 104 or 106 and consent of Chemistry Department. A more rigorous treatment of the material of CHEM 203. This course must be accompanied by CHEM 214 unless credit for CHEM 214 has previously been established. (Staff)

CHEM 214 (026). PRINCIPLES OF COLLEGE CHEMISTRY LABORATORY IV. (2)
One lecture and one three-hour laboratory per week. Prerequisite, CHEM 104 or 106 and consent of the Chemistry Department. A more rigorous treatment of the material of CHEM 204. This course must be accompanied by CHEM 213. (Staff)

CHEM 219 (019). ELEMENTS OF QUANTITATIVE ANALYSIS. (4)
Two lectures and two three-hour laboratory periods per week. Prerequisite, CHEM 003. An introduction to the basic theory and techniques of volumetric and gravimetric analysis. Primarily for students in engineering, agriculture, pre-medical, and pre-dental curricula. (Not offered after fall, 1972). (Stuntz)

CHEM 302 (110). RADIOCHEMICAL SAFETY PROCEDURES. (1)
One lecture per week. A lecture and demonstration course. Radiation hazards, principles and practices of radiation safety, federal (AEC, ICC) codes and state public health. (Lakshmanan)

CHEM 321 (121). INTERMEDIATE QUANTITATIVE ANALYSIS. (4)
Two lectures and two three-hour laboratory periods per week. Prerequisites, CHEM 219 or 021, and CHEM 033 or 037. A continuation of CHEM 219 or 021, including volumetric, gravimetric, electrometric, and colorimetric methods. Intended for students in agricultural chemistry, general physical science, science education, etc. Not open to chemistry majors. (Staff)

CHEM 399 (194). INTRODUCTION TO CHEMICAL RESEARCH (1-2)
Prerequisite, junior standing. Registration only upon consent of the course coordinator. The course will allow students to conduct basic research under the supervision of a member of the department. May be repeated for credit to a maximum of four credits. (Staff)

CHEM 401 (101). INORGANIC CHEMISTRY. (3)
Three lectures per week. Prerequisite, CHEM 481. (Staff)

CHEM 402 (102). INORGANIC PREPARATIONS. (2)
Two three-hour laboratory periods per week. Prerequisite, CHEM 421. (Staff)

CHEM 403 (205). RADIOCHEMISTRY. (3)
Three lectures per week. Prerequisite, one year of college chemistry and one year of college physics. Radioactive decay; introduction to properties of atomic nuclei; nuclear processes in cosmology; chemical, biomedical and environmental applications of radioactivity; nuclear processes as chemical tools; interaction of radiation with matter. (Viola)

CHEM 421 (123). ADVANCED QUANTITATIVE ANALYSIS. (3)
Two lectures and two three-hour laboratory periods per week. Pre- or corequisite, CHEM 482. A continuation of CHEM 021, including volumetric, gravimetric, electrometric, and colorimetric methods. Required of all students majoring in chemistry. (Purdy)

CHEM 422 (125). INSTRUMENTAL ANALYSIS. (4)
Second Semester. Two lectures and six hours of laboratory per week. Prerequisite, CHEM 482. A study of the application of physicochemical methods to analytical chemistry. Techniques such as polarography, conductivity and spectrophotometry will be included. (Purdy)

CHEM 423 (150). ORGANIC QUANTITATIVE ANALYSIS. (2)
Two three-hour laboratory periods per week. Prerequisites, CHEM 219 or 021, and consent of the instructor. The semi-micro determination of carbon, hydrogen, nitrogen, halogen and certain functional groups. (Kasler)

CHEM 440 (141). ADVANCED ORGANIC CHEMISTRY. (2)
Two lectures per week. Prerequisite, CHEM 037, 038. An advanced study of the compounds of carbon. (Not offered after fall, 1971). (Reeve)

CHEM 441 (143). ADVANCED ORGANIC CHEMISTRY. (2)
Two lectures per week. Prerequisite, CHEM 440. A continuation of CHEM 440. (Reeve)

CHEM 442 (144). ADVANCED ORGANIC LABORATORY. (2-4)
Two or four three-hour laboratory periods per week. Prerequisites, CHEM 037, 038. (Staff)

CHEM 443 (148). THE IDENTIFICATION OF ORGANIC COMPOUNDS. (2)
Two three-hour laboratory periods per week. Prerequisite, CHEM 440. The systematic identification of organic compounds. (Staff)

CHEM 461 (161). BIOCHEMISTRY I. (3)
Three lectures per week. Prerequisite, one year of organic chemistry. A comprehensive introduction to general biochemistry wherein the chemistry and metabolism of carbohydrates, lipids, nucleic acids, and proteins are discussed. (Holmlund)

CHEM 462 (163). BIOCHEMISTRY II. (3)
Three lectures per week. Prerequisite, CHEM 461. A continuation of CHEM 461. (Holmlund)

CHEM 463, 464 (162, 164). BIOCHEMISTRY LABORATORY. (2, 2)
Two three-hour laboratory periods per week. Prerequisite, CHEM 461, 462 or concurrent registration in CHEM 461, 462. (Staff)

CHEM 472 (103). PRINCIPLES OF GEOCHEMISTRY. (3)
Three lectures per week. Prerequisite, CHEM 104 or equivalent, and senior standing. A survey of historical and modern theories of the origin of the universe and the solar system. The origin of elements and their distributions in space, on extra-terrestrial bodies and on earth. Discussion of the origin of igneous rocks, of the physical and chemical factors governing development and distribution of sedimentary rocks, of the oceans, and of the atmosphere. Organic sediments, the internal structures of Earth and the planets, the role of isotopes in geothermometry and in the solution of other problems. (Breger)

CHEM 473 (104). GEOCHEMISTRY OF SOLIDS. (3)
Three lectures per week. Prerequisite, CHEM 482 or GEOL 422. Principles of crystal chemistry applied to structures, properties and reactions of minerals and non-metallic solids. Emphasis is placed on the relation of structural stability to bonding, ionic size, charge, order-disorder, polymorphism, and isomorphism. (Sommer)

CHEM 474 (105). ENVIRONMENTAL CHEMISTRY. (3)
Three lectures per week. Prerequisite, CHEM 481, or equivalent. The sources of various elements and chemical reactions between them in the atmosphere and hydrosphere are treated. Causes and biological effects of air and water pollution by certain elements are discussed. (Gordon or Zoller)

CHEM 475 (106). CHEMICAL OCEANOGRAPHY. (3)
Three lectures per week. Prerequisite, CHEM 103 or equivalent, and one additional semester of physical science. An introduction to physical, chemical and geological processes that occur in the marine environment including physical and chemical properties of sea water, geology of the sea floor, general circulation of the ocean, currents, waves, and tides. (Sommer)

CHEM 481, 482 (187, 189). PHYSICAL CHEMISTRY. (3, 3)
Three lectures per week. Prerequisite, CHEM 219 or 021, MATH 141, PHYS 263 (PHYS 263 may be taken concurrently with CHEM 481) or consent of instructor. A course primarily for chemists and chemical engineers. (Staff)

CHEM 483, 484 (182, 184). PHYSICAL CHEMISTRY LABORATORY FOR CHEMISTRY MAJORS. (1, 1)
One three-hour laboratory per week. Prerequisites, CHEM 219, 021; CHEM 481, 482 must be taken concurrently. (Staff)

CHEM 485 (195). ADVANCED PHYSICAL CHEMISTRY. (2)
Prerequisite, CHEM 482. Quantum chemistry and other selected topics. (Staff)

CHEM 486 (186). ADVANCED PHYSICAL CHEMISTRY LABORATORY. (2)
Two three-hour laboratory periods per week. Prerequisites, CHEM 482, 484. (Staff)

CHEM 493, 494 (188, 190). PHYSICAL CHEMISTRY LABORATORY. (2, 2)
Two three-hour laboratory periods per week. A laboratory course for chemical engineering students taking CHEM 481, 482. Students who have had CHEM 219, 021 or equivalent cannot register for this course. (Staff)

CHEM 498 (196). SPECIAL TOPICS IN CHEMISTRY. (3)
Three lectures or two lectures and one three-hour laboratory per week. Prerequisite varies with the nature of the topic being considered. Course may be repeated for credit if the subject matter is substantially different, but not more than three credits may be accepted in satisfaction of major supporting area requirements for chemistry majors. (Staff)

CHEM 499 (199H). SPECIAL PROJECTS. (2)
Honors projects for undergraduate students. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

CHEM 601 (201). ADVANCED INORGANIC CHEMISTRY. (2) (Staff)

CHEM 603, 604 (202, 204). ADVANCED INORGANIC LABORATORY. (2, 2). (Staff)

CHEM 605 (207). CHEMISTRY OF COORDINATION COMPOUNDS. (2) (Staff)

CHEM 606 (211). CHEMISTRY OF ORGANOMETALLIC COMPOUNDS. (2) (Staff)

CHEM 607 (203). THE CHEMISTRY OF THE RARER ELEMENTS. (2) (Staff)

CHEM 608 (213). SELECTED TOPICS IN INORGANIC CHEMISTRY. (2) (Staff)

CHEM 621, 622 (221, 223). CHEMICAL MICROSCOPY. (2, 2) (Staff)

CHEM 623 (227). OPTICAL METHODS OF QUANTITATIVE ANALYSIS. (3) (Staff)

CHEM 624 (229). ELECTRICAL METHODS OF QUANTITATIVE ANALYSIS. (3) (Staff)

CHEM 625 (231). SEPARATION METHODS IN QUANTITATIVE ANALYSIS. (3) (Staff)

CHEM 628 (233). MODERN TRENDS IN ANALYTICAL CHEMISTRY. (2) (Staff)

CHEM 641 (237). ORGANIC REACTION MECHANISMS. (3) (Staff)

CHEM 642 (239). PHYSICAL ORGANIC CHEMISTRY. (3) (Staff)

CHEM 643 (240). ORGANIC CHEMISTRY OF HIGH POLYMERS. (2) (Staff)

CHEM 644 (243). MOLECULAR ORBITAL THEORY. (2) (Staff)

CHEM 645 (245). THE CHEMISTRY OF THE STEROIDS. (2) (Staff)

CHEM 646 (251). THE HETEROCYCLICS. (2) (Staff)

CHEM 648 (253). SPECIAL TOPICS IN ORGANIC CHEMISTRY. (2) (Staff)

CHEM 661 (261). PROTEINS, AMINO ACIDS AND CARBOHYDRATES. (2) (Staff)

CHEM 662 (263). BIOLOGICAL ENERGY TRANSDUCTIONS, VITAMINS, AND HORMONES. (2) (Staff)

CHEM 663 (265). ENZYMES. (2) (Staff)

CHEM 664 (267). THE CHEMISTRY OF NATURAL PRODUCTS. (2) (Staff)

CHEM 665 (271). BIOCHEMISTRY OF LIPIDS. (2) (Staff)

CHEM 666 (275). BIOPHYSICAL CHEMISTRY. (2) (Staff)

CHEM 668 (268). SPECIAL PROBLEMS IN BIOCHEMISTRY. (2-4) (Staff)

CHEM 669 (273). SPECIAL TOPICS IN BIOCHEMISTRY. (2) (Staff)

CHEM 681 (287). INFRARED AND RAMAN SPECTROSCOPY. (2) (Staff)

CHEM 682 (299). REACTION KINETICS. (3) (Staff)

CHEM 683 (303). ELECTROCHEMISTRY. (3) (Staff)

CHEM 684 (307). CHEMICAL THERMODYNAMICS. (3) (Staff)

CHEM 685 (313). MOLECULAR STRUCTURE. (3) (Staff)

CHEM 686 (317). CHEMICAL CRYSTALLOGRAPHY. (3) (Staff)

CHEM 687 (323). STATISTICAL MECHANICS AND CHEMISTRY. (3) (Staff)

CHEM 688 (291). SELECTED TOPICS IN PHYSICAL CHEMISTRY. (2) (Staff)

CHEM 689 (293). SPECIAL TOPICS IN PHYSICAL CHEMISTRY. (3) (Staff)

CHEM 690, 691 (319, 321). QUANTUM CHEMISTRY. (3, 3) (Staff)

CHEM 702 (210). RADIOCHEMISTRY LABORATORY. (1-2) (Staff)

CHEM 703 (269). ADVANCED RADIOCHEMISTRY. (2) (Staff)

CHEM 704 (270). ADVANCED RADIOCHEMISTRY LABORATORY. (1-2) (Staff)

CHEM 705 (215). NUCLEAR CHEMISTRY. (2) (Staff)

CHEM 718 (336). SPECIAL TOPICS IN NUCLEAR CHEMISTRY. (1-3) (Staff)

CHEM 721 (331). ORGANIC GEOCHEMISTRY. (3) (Breger)

CHEM 722 (332). COSMOCHEMISTRY. (3) (Barker)

CHEM 723 (333). MARINE GEOCHEMISTRY. (3) (Sommer)

CHEM 728 (334). SELECTED TOPICS IN ANALYTICAL CHEMISTRY. (2-3) (Rose)

CHEM 729 (335). SPECIAL TOPICS IN GEOCHEMISTRY. (1-3) (Staff)

CHEM 799 (399). THESIS RESEARCH. (Cr Arr) (Staff) (Staff)

CHEM 898 (351). SEMINAR. (1) (Staff)

CHEM 899 (499). DISSERTATION RESEARCH. (Cr Arr) (Staff)

CHINESE

Assistant Professor and Director: Chin.
Instructors: Chen and Loh.

The department offers an intensive program for the first year for which students earn twelve (12) credits in a year (six each semester). The approach is audio-lingual and communication-oriented.

A minor in the Chinese language consists of eighteen (18) credit hours. Six of these hours must be in courses at the 400-level, or above.

CHIN 101, 102 (001, 002). INTENSIVE ELEMENTARY CHINESE. (6, 6)
Introduction to reading, writing, and speaking Chinese with an emphasis on mastering the essentials of pronunciation, basic characters and structural patterns. Eight hours per week. (Staff)

CHIN 201, 202 (006, 007). INTERMEDIATE CHINESE. (3, 3)
Three recitations per week; additional electronic laboratory in CHIN 201. Prerequisite, CHIN 102 or equivalent. Reading of texts designed to give some knowledge of Chinese life, thought and culture. (Chen)

CHIN 301, 302 (101, 102). READING FROM CHINESE HISTORY. (3, 3)
Prerequisite, CHIN 202 or equivalent. Based on anthology of historians from the Chou to the Ching dynasties. (Loh)

CHIN 411, 412 (171, 172). CHINESE CIVILIZATION. (3, 3)
This course supplements GEOG 422; Cultural Geography of China and Japan. It deals with Chinese literature, art, folklore, history, government, and great men. Second semester: developments in China since 1911. The course is given in English translation. (Loh)

CHIN 421, 422 (117, 118). CHINESE LINGUISTICS. (3, 3)
Prerequisite, CHIN 202 or equivalent. (Chin)

CLASSICAL LANGUAGES AND LITERATURES

Professor and Chairman: Avery.
Associate Professor: Hubbe.
Lecturer: Iversen.
Instructor: Clapper.

Major in Latin: LATN 101, 102, 203 and 204 or their equivalent must have been completed before

a student may begin work on a major. A major consists of a minimum of twenty-four hours beginning with LATN 305, twelve hours of which must be taken in 400-level courses. In addition, a student majoring in Latin will be required to take as supporting courses LATN 170, HIFN 456, and HIFN 410. He is urged to pursue a strong supporting program in Greek. The following courses are recommended as electives: HIST 251 and 252, ARTH 402 and 403, and PHIL 310. No course in the Latin language with a grade less than C may be used to satisfy major requirements.

Normally no placement tests are given in the classical languages. The following schedule will apply in general in determining the course level at which students will register for Latin.

Students offering 0 or 1 unit of Latin will register for LATN 101.

Students offering 2 units of Latin will register for LATN 203.

Students offering 3 units of Latin will register for LATN 204.

Students offering 4 units of Latin will register for LATN 305.

However, those presenting 2, 3 or 4 units of preparatory work may register initially for the next higher course by demonstrating proficiency through a placement test. Students whose stage of achievement is not represented here are urgently invited to confer with the chairman of the department. Students who wish to continue the study of Greek should likewise confer with the chairman of the department. No credit will be given for less than two semesters of elementary Latin or Greek except as provided below in the course descriptions of LATN and GREK 101.

LATIN

LATN 101, 102 (001, 002). ELEMENTARY LATIN. (3, 3)
A student who has had two units of Latin in high school may register for LATN 101 for purposes of review, but not for credit; however, he may, under certain conditions, register for LATN 102 for credit with departmental permission. (Clapper)

LATN 170 (070). GREEK AND ROMAN MYTHOLOGY. (3)
Taught in English, no prerequisite. Cannot be taken for language credit. *This course is particularly recommended for students planning to major in foreign languages, English, history, the fine arts, or journalism.*
(Iversen, Clapper)

LATN 203 (003). INTERMEDIATE LATIN (CAESAR). (3)
Prerequisite, LATN 101, 102 or equivalent. (Staff)

LATN 204 (004). INTERMEDIATE LATIN (CICERO). (3)
Prerequisite, LATN 203 or equivalent. (Staff)

LATN 305 (005). VERGIL'S AENEID. (3)
Prerequisite, LATN 204 or equivalent. (Iversen)

LATN 351 (051). HORACE. (3)
Prerequisite, LATN 305 or equivalent. (Iversen)

LATN 352 (052). LIVY. (3)
Prerequisite, LATN 351 or equivalent (Iversen)

LATN 361 (061). PLINY'S LETTERS. (3)
Prerequisite, LATN 352 or equivalent. (Iversen)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Prerequisite for 400-level courses, LATN 361.

LATN 401 (101). CATULLUS AND THE ROMAN ELEGIAC POETS. (3) (Avery)

LATN 402 (102). TACITUS. (3) (Avery)

LATN 403 (103). ROMAN SATIRE. (3) (Avery)

LATN 404 (104). ROMAN COMEDY. (3) (Avery)

LATN 405 (105). LUCRETIUS. (3) (Avery)

LATN 411 (111). ADVANCED LATIN GRAMMAR. (3)
Prerequisite, three years of college Latin or equivalent. An intensive study of the morphology and syntax of the Latin language supplemented by rapid reading. (Avery)

LATN 499 (199). LATIN READINGS. (3)
Prerequisite, consent of instructor. The reading of one or more selected Latin authors from antiquity through the Renaissance. Reports. May be repeated with different content. (Avery)

FOR GRADUATES

LATN 610 (210). VULGAR LATIN READINGS. (3)
Prerequisite, consent of instructor. An intensive review of the phonology, morphology, and syntax of Classical Latin, followed by the study of the deviations of Vulgar Latin from the classical norms, with the reading of illustrative texts. The reading of selections from the *Peregrinatio ad loca sancta* and the study of divergences from classical usage therein, with special emphasis on those which anticipate subsequent developments in the Romance languages. Reports. (Avery)

GREEK

GREK 101, 102 (001, 002). ELEMENTARY GREEK. (3, 3)
A student who has had two units of Greek in high school may register for GREK 101 for purposes of review, but not for credit; however, he may, under certain conditions, register for GREK 102 for credit with departmental permission. (Hubbe)

GREK 203 (003). INTERMEDIATE GREEK, GRAMMAR AND READING. (3)
Prerequisite, GREK 101, 102 or equivalent. (Hubbe)

GREK 204 (004). INTERMEDIATE GREEK (HOMER). (3)
Prerequisite, GREK 203 or equivalent. (Hubbe)

Prerequisite for 300-level courses, GREK 204 or equivalent, except that, with the instructor's permission, a student who plans to take no more than four semesters of Greek may substitute GREK 352 for GREK 204.

GREK 351 (051). EURIPIDES. (3) (Hubbe)
GREK 352 (006). THE NEW TESTAMENT. (3) (Hubbe)
GREK 353 (005). HERODOTUS. (3) (Hubbe)
GREK 354 (054). GREEK LYRIC POETRY. (3) (Hubbe)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

GREK 401 (101). THUCYDIDES. (3) (Hubbe)
GREK 402 (102). GREEK PHILOSOPHERS. (3) (Hubbe)
GREK 403 (103). GREEK TRAGEDY. (3) (Hubbe)
GREK 404 (104). GREEK COMEDY. (3) (Hubbe)
GREK 405 (105). GREEK ORATORY.(3) (Hubbe)
GREK 406 (106). GREEK EPIGRAPHY. (3) (Hubbe)
GREK 499 (199). GREEK READINGS. (3)
Prerequisite, consent of the instructor. The reading of one or more selected Greek authors. Reports. May be repeated with different content. (Hubbe)

COMPARATIVE LITERATURE

Advisory Committee on Comparative Literature

Professors: Freedman (Chairman), G. Jones, R. T. Swigger, W. MacBain, C. Hering, and G. Nemes.

Professors: Goodwyn, Jones.

Associate Professors: Perloff, Salamanca, D. Smith.

Assistant Professors: Swigger, Berry, Gilbert, Greenwood, Salchenberger, Tinsley, Walt.

Undergraduates may emphasize comparative literature as they work toward a degree in one of the departments of literature. Each student will be formally advised by the faculty of his "home" department. In general, every student will be required to take CMLT 401, and CMLT 402, and, during his last year, CMLT 496. The various literature departments concerned will have additional specific requirements.

Students emphasizing comparative literature are expected to develop a high degree of competence in at least one foreign language.

Course work may not be limited to the nineteenth and twentieth centuries.

LATN 170 is highly recommended.

FOR UNDERGRADUATES

CMLT 401, 402 (101, 102). INTRODUCTORY SURVEY OF COMPARATIVE LITERATURE. (3, 3)
First semester. Survey of the background of European literature through study of the Greek and Latin literature in English translations, discussing the debt of modern literature to the ancients.
Second semester: study of the medieval and modern continental literature. (Staff)

CMLT 411 (114). THE GREEK DRAMA. (3)
The chief works of Aeschylus, Sophocles, Euripides, and Aristophanes in English translations. Emphasis on the historic background, on dramatic structure, and on the effect of the Attic drama upon the mind of the civilized world. (Staff)

CMLT 415 (103). THE OLD TESTAMENT AS LITERATURE. (3)
A study of sources, development and literary types. (Greenwood)

CMLT 416 (104). THE NEW TESTAMENT AS LITERATURE. (3)
A study of the books of the New Testament, with attention to the relevant historical background and to the transmission of the text. A knowledge of Greek is helpful, but not essential. (Greenwood)

CMLT 421, 422 (115, 116). THE CLASSICAL TRADITION AND ITS INFLUENCE IN THE MIDDLE AGES AND THE RENAISSANCE. (3, 3)
Emphasis on major writers. Reading knowledge of Greek or Latin required. (Staff)

CMLT 430 (125). LITERATURE OF THE MIDDLES AGES. (3)
Narrative, dramatic and lyric literature of the Middle Ages studied in translation. (Staff)

CMLT 433 (135). DANTE AND THE ROMANCE TRADITION. (3)
A reading of the *Divine Comedy* to enlighten the discovery of reality in western literature. (Salchenberger)

CMLT 440, 441 (140, 141). LITERATURE OF THE FAR EAST. (3, 3)
A survey of the literature of China and Japan. First semester: an examination of the development of Chinese and Japanese literature up to the Yuan and Kamakura period. Second semester: the literature from the fourteenth century to the present. (Staff)

CMLT 461 (105). ROMANTICISM: EARLY STAGES. (3)
First semester. Emphasis on England, France and Germany. Reading knowledge of French or German required. (Staff)

CMLT 462 (106). ROMANTICISM: FLOWERING AND INFLUENCE. (3)
Second semester. Emphasis on England, France and Germany. Reading knowledge of French or German required. (Staff)

CMLT 463 (107). THE FAUST LEGEND IN ENGLISH AND GERMAN LITERATURE. (3)
A study of the Faust legend of the Middle Ages and its later treatment by Marlowe in *Dr. Faustus* and by Goethe in *Faust*. (Staff)

CMLT 469 (130). THE CONTINENTAL NOVEL. (3)
The novel in translation from Stendhal through the Existentialists, selected from literatures of France, Germany, Italy, Russia, and Spain. (Walt, Swigger)

CMLT 470 (112). IBSEN AND THE CONTINENTAL DRAMA. (3)
Emphasis on the major work of Ibsen, with some attention given to selected predecessors, contemporaries and successors. (D. Smith)

CMLT 479 (145). MAJOR CONTEMPORARY AUTHORS. (3) (Staff)

CMLT 488 (147). GENRES. (3)
A study of a recognized literary form, such as tragedy, epic, satire, literary criticism, comedy, tragicomedy, etc. The course may be repeated for cumulative credit up to six hours when different material is presented. (Staff)

CMLT 489 (170). MAJOR WRITERS. (3)
Each semester two major writers from different cultures and languages will be studied. Authors will be chosen on the basis of significant relationships of cultural and aesthetic contexts, analogies between their respective works, and the importance of each writer to his literary tradition.

CMLT 496 (150). CONFERENCE COURSE IN COMPARATIVE LITERATURE. (3)
Second semester. A tutorial type discussion course, correlating the courses in various literatures which the student has previously taken with the primary themes and masterpieces of world literature. This course is required of undergraduate majors in Comparative Literature, but must not be taken until the final year of the student's program. (Swigger)

CMLT 498 (179). SELECTED TOPICS IN COMPARATIVE LITERATURE. (3)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

CMLT 601 (201). PROBLEMS IN COMPARATIVE LITERATURE. (3) (Swigger)

CMLT 610 (258). FOLKLORE IN LITERATURE. (3) (Goodwyn)

CMLT 631 (225). THE MEDIEVAL EPIC. (3) (Jones)

CMLT 632 (226). THE MEDIEVAL ROMANCE. (3) (Jones)

CMLT 639 (235). STUDIES IN THE RENAISSANCE: AS ANNOUNCED.(3)

CMLT 640 (235). THE ITALIAN RENAISSANCE AND ITS INFLUENCE. (3) (Salchenberger)

CMLT 642 (230). PROBLEMS OF THE BAROQUE IN LITERATURE. (3) (Staff)

CMLT 681 (240). LITERARY CRITICISM—ANCIENT AND MEDIEVAL. (3) (Greenwood)

CMLT 682 (241). LITERARY CRITICISM—RENAISSANCE AND MODERN. (3) (Staff)

CMLT 690 (268). SEMINAR IN LITERARY SOURCES OF ART HISTORY. (3) (Staff)

CMLT 799 (399). M.A. RESEARCH. (1-6) (Staff)

CMLT 801 (301). SEMINAR IN THEMES AND TYPES. (3) (Staff)

CMLT 899 (499). PH.D. RESEARCH. (1-6) (Staff)

COMPUTER SCIENCE

Professor and Director: Atchison.

Professors: Chu,[1] Edmundson,[2] Glasser,[3] Heilprin,[1] Kanal.

Research Professors: Ortega,[5] Rheinboldt,[5] Rosenfeld.

Associate Professors: Glaser,[6] Minker.

Assistant Professors: Austing, Basili, Feldman, Hagerty, Lay, McClellan, Park, Vandergraft.

Instructor and Associate Director: Menard.

Instructors: Nagel, Williams.

The educational program in computer science is administered by the Computer Science Center which is an academic unit of the University not affiliated with any particular school or college. This description of the program is included in the catalog of the College of Arts and Sciences for the convenience of students and faculty of the College. The Computer Science Center provides computing service for all academic activities of the University and conducts an active research program in the computer and computer-related sciences.

No bachelor's degree program in computer science is offered at this University. The basic undergraduate courses are designed to offer students in all fields an introduction to the academic discipline concerned with the use of computers. The advanced undergraduate courses offer suitable preparation for graduate study in computer science or supporting work for students majoring in other areas. The Computer Science Center offers the Master of Science and Doctor of Philosophy degrees in computer science. An undergraduate student interested in these programs or in specific computer science courses should consult his advisor as early in his preparation as possible.

FOR UNDERGRADUATES

CMSC 100 (005). INTRODUCTION TO USE OF THE DIGITAL COMPUTER. (1)

An introduction to the use of FORTRAN for solution of simple computational tasks. The use of a conversational mode to simplify the computational process will be emphasized. Where possible students will be assigned to sections of comparable background. Examples and problems for the sections will be chosen appropriate to the background of the students.

CMSC 103 (012). INTRODUCTORY ALGORITHMIC METHODS. (3)

Two lectures and one two-hour laboratory period per week. Prerequisite, MATH 111 or equivalent. Recommended for students not majoring in mathematics, the physical sciences or engineering. Study of the algorithmic approach in the analysis of problems and their computational solution. Definition and use of a particular algorithmic language. Computer projects based on elementary algebra and probability; linear equations and matrices; and the ordering, searching, sorting, and manipulating of data.

CMSC 110 (020). ELEMENTARY ALGORITHMIC ANALYSIS. (3)

Two lectures and one two-hour laboratory period per week. Pre- or corequisite, MATH 141 or equivalent. Recommended for students majoring in mathematics, the physical sciences or engineering. Concept and properties of an algorithm, language and notation for describing algorithms, analysis of computational problems and development of algorithms for their solution, use of specific algorithmic languages in solving problems from numerical mathematics, completion of several projects using a computer.

CMSC 210 (100). LANGUAGE AND STRUCTURE OF COMPUTERS. (3)

Two lectures and one two-hour laboratory period per week. Prerequisite, CMSC 103 or CMSC 110 or equivalent. Logical basis of computer structure, machine presentation of numbers and characters, flow of control, instruction codes, arithmetic and logical operations, indexing and indirect addressing, input-output, pushdown stacks, symbolic representation of programs and assembly systems, subroutine linkage, macros, interpretive systems, and recent advances in computer organization. Several computer projects to illustrate basic concepts.

CMSC 268 (021). NUMERICAL CALCULUS LABORATORY. (1-2)

Two hours laboratory per week for each credit hour. Prerequisite, MATH 240, or concurrent registration therein and CMSC 110, or equivalents. Laboratory work in the development of algorithmic solutions of problems taken from numerical calculus with emphasis on efficiency of computation, and the control of errors. Basic one-credit laboratory includes completion of several machine projects on material related to MATH 021. Second credit involves more comprehensive projects based on similar or related material.

CMSC 314 (120). INTRODUCTION TO COMPUTER LANGUAGES AND SYSTEMS. (3)

Prerequisite, MATH 241 or equivalent. Organization and characteristics of computers. Procedure oriented and assembly languages. Representation of data, characters and instructions. Introduction to logic design and systems organization. Macro definition and generation. Program segmentation and linkage. Extensive use of the computer to complete projects illustrating programming techniques and machine structure.

CMSC 340 (102). INTRODUCTION TO DISCRETE STRUCTURES. (3)

Prerequisite, CMSC 110 or equivalent. This is the same course as ENEE 450. Review of set algebra including relations, partial ordering and mappings. Algebraic structures including semigroups and groups. Graph theory including trees and weighted graphs. Boolean algebra and propositional logic. Applications of these structures to various areas of computer science and computer engineering.

CMSC 388 (110). SPECIAL COMPUTATIONAL LABORATORY. (1 or 2)

Two hours laboratory per week for each credit hour. Prerequisite, CMSC 103 or equivalent. Arranged for special groups of students to give experience in developing algorithmic solutions of problems or using particular computational systems. May be taken for cumulative credit up to a maximum of six hours where different material is covered.

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[1] Joint appointment with Electrical Engineering.
[2] Joint appointment with Mathematics.
[3] Joint appointment with Physics and Astronomy.
[4] Joint appointment with Library and Information Services.
[5] Joint appointment with Institute for Fluid Dynamics and Applied Mathematics.
[6] Joint appointment with Physiology.

CMSC 410 (160). COMPUTER ORGANIZATION. (3)
Prerequisite, CMSC 210 or equivalent. This is the same course as ENEE 440. Introduction. Computer elements. Parallel adders and subtracters. Micro-operations. Sequences. Computer simulation. Organization of a commercially available stored program computer. Microprogrammed computers. A large-scale batch-processing system.

CMSC 420 (150). DATA AND STORAGE STRUCTURES. (3)
Prerequisite, CMSC 210 and CMSC 340 or equivalent. A study of intrinsic structures of data, such as arrays, strings, trees, and lists, and their relation to storage media. Representation of data structures in storage by records, files, etc. Special storage structures such as content addressed, trie, and associative memories. Referencing, processing, and management techniques based on the structuring, e.g., list processing. Storage and accessing efficiency, as well as dynamic flexibility of various methods.

CMSC 440 (140). STRUCTURE OF PROGRAMMING LANGUAGES. (3)
Prerequisite, CMSC 210 or equivalent. Formal definition of languages including specification of syntax and semantics. Syntactic structure and semantics of simple statements including precedence, infix, prefix, and postfix notation. Global structure and semantics of algorithmic languages including declarations and storage allocation, grouping of statements and binding time of constituents, subroutines, coroutines, tasks and parameters. List processing and data description languages.

CMSC 450 (144). ELEMENTARY LOGIC AND ALGORITHMS. (3)
Prerequisite, MATH 240 or consent of instructor. This is the same course as MATH 444. An elementary development of propositional logic, predicate logic, set algebra, and Boolean algebra, with a discussion of Markov algorithms,Turing machines and recursive functions. Topics include Post productions, word problems, and formal languages.

CMSC 460 (168). NUMERICAL METHODS FOR SCIENTISTS AND ENGINEERS. (3)
Prerequisites, MATH 241 or 462, MATH 246, and CMSC 110 or equivalent. This is the same course as MATH 460. Interpolation, numerical differentiation and integration, numerical solution of polynomial and transcendental equations, least squares, systems of linear equations, numerical solution of ordinary differential equations, errors in numerical calculations.

CMSC 470 (170). NUMERICAL ANALYSIS I. (3)
Pre- or corequisite. MATH 410. This is the same course as MATH 470. Solution of linear systems of equations and nonlinear equations in one variable. Least square and Chebyshev approximation. Numerical differentiation, integration, and solution of ordinary differential equations.

CMSC 471 (171). NUMERICAL ANALYSIS II. (3)
Prerequisites, MATH 400 or 405, MATH 410, and CMSC/MATH 470. This is the same course as MATH 471. Linear systems of equations: norms, condition numbers, rounding error analysis, iterative methods; introduction to numerical solution of partial differential equations. Nonlinear systems of equations: Newton's method, convergence and rate of convergence. Eigenvalue problems.

CMSC 485 (132). SIMULATION OF CONTINUOUS SYSTEMS. (3)
Prerequisites, CMSC 110 and MATH 246, or equivalent. Introduction to digital simulation; simulation by MIMIC programming; simulation by FORTRAN programming; simulation by DSL-90 (or CSMP) programming; logic and construction of a simulation processor; similarity between digital simulations of continuous and discrete systems.

CMSC 498 (190). SPECIAL PROBLEMS IN COMPUTER SCIENCE. (1-3)
Prerequisite, permission of instructor. An individualized course designed to allow a student or students to pursue a specialized topic or project under the supervision of the senior staff. Credit according to work done.

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

CMSC 600 (200). PROGRAMMING SYSTEMS. (3)
CMSC 610 (202). COMPUTER SYSTEMS. (3)
CMSC 620 (204). INFORMATION PROCESSING. (3)
CMSC 640 (206). COMPUTABILITY AND AUTOMATA. (3)
CMSC 660 (266). ALGORITHMIC NUMERICAL ANALYSIS. (3)
CMSC 700 (240). TRANSLATION OF PROGRAMMING LANGUAGES. (3)
CMSC 710 (230). SIMULATION OF COMPUTERS AND SOFTWARE. (3)
CMSC 720 (255). INFORMATION RETRIEVAL. (3)
CMSC 723 (252). COMPUTATIONAL LINGUISTICS. (3)
CMSC 725 (250). MATHEMATICAL LINGUISTICS. (3)
CMSC 730 (280). ARTIFICIAL INTELLIGENCE. (3)
CMSC 733 (285). COMPUTER PROCESSING OF PICTORIAL INFORMATION. (3)
CMSC 737 (258). TOPICS IN INFORMATION SCIENCE. (3)
CMSC 740 (220). AUTOMATA THEORY. (3)
CMSC 745 (245). THEORY OF FORMAL LANGUAGES. (3)
CMSC 750 (215). THEORY OF COMPUTABILITY. (3)
CMSC 755 (210). THEORIES OF INFORMATION. (3)
CMSC 780 (225). COMPUTER APPLICATIONS TO THE PHYSICAL SCIENCES. (3)
CMSC 782 (235). MODELING AND SIMULATION OF PHYSICAL SYSTEMS. (3)
CMSC 798 (295). GRADUATE SEMINAR IN COMPUTER SCIENCE. (1-3)
CMSC 799 (399). THESIS RESEARCH. (Arranged)
CMSC 818 (290). ADVANCED TOPICS IN COMPUTER SYSTEMS. (3)
CMSC 838 (290). ADVANCED TOPICS IN INFORMATION PROCESSING. (3)
CMSC 840 (265). ADVANCED AUTOMATA THEORY. (3)
CMSC 858 (290). ADVANCED TOPICS IN THEORY AND METATHEORY. (3)
CMSC 878 (290). ADVANCED TOPICS IN NUMERICAL METHODS. (3)
CMSC 898 (290). ADVANCED TOPICS IN APPLICATIONS. (3)
CMSC 899 (499). DISSERTATION RESEARCH. (Arranged)

INSTITUTE OF CRIMINAL JUSTICE AND CRIMINOLOGY

Professor and Director: Lejins.
Lecturer: Ingraham.

ADVISORY COUNCIL: The Advisory Council is made up of representatives of the areas of education, law, psychiatry, psychology, public administration, social work, sociology, and University College: Dr. Richard P. Claude, Department of Government and Politics, College of Business and Public Administration; Dean Stanley J. Drazek, University College; Professor Robert G. Fisher, School of Law; Dr. Jonas Rappeport, Psychiatric Institute; Professor Eric Seidman, College of Education; Dean Daniel Thursz, School of Social Work; Dr. Robert S. Waldrop, Department of Psychology.

ADVISORY BOARD: The Advisory Board is made up of representatives of the state agencies in the field of law enforcement and corrections, representatives of appropriate private agencies and organizations as well as representatives of national agencies and organizations.

The purpose of the institute is to provide an organizational and administrative basis for the interests and activities of the University, its faculty and students in the areas usually designated as law enforcement, criminology and corrections. The institute is to promote study and teaching concerning the problems of crime and delinquency by offering and coordinating academic programs in the area of law enforcement, criminology and corrections; managing research in these areas; and conducting demonstration projects.

The institute comprises as its component parts:

1. The Criminology Program, which is a Division of the Department of Sociology.
2. The Law Enforcement Curriculum.
3. The program leading to a Bachelor of Arts in General Studies with specializations in law enforcement and corrections offered by the University College.
4. Other appropriate divisions to be developed for the areas of research and demonstration projects.

The major in law enforcement comprises 30 hours of course work in law enforcement and criminology, the latter being offered as courses in the Division of Criminology of the Department of Sociology, divided as follows: 18, but not more than 24, hours in law enforcement; 6, but not more than 12, hours in criminology; Sociology 201 or Psychology 200; supporting courses, 18 hours in government and politics, psychology, or sociology (see recommended list in department office). Student *may* use an additional 6 hours to bring the major up to 36 hours. No grade lower than C may be used toward the major.

LAW ENFORCEMENT CURRICULUM

LENF 100 (001). INTRODUCTION TO LAW ENFORCEMENT. (3)
Introduction to the administration of crimnal justice in a democratic society with emphasis upon the theoretical and historical development of law enforcement. The principles of organization and administration for law enforcement; functions and specific activities; planning and research; public relations; personnel and training; inspection and control; direction; policy formulation.

LENF 220 (020). INVESTIGATION IN LAW ENFORCEMENT. (3)
Investigation as a process of communication. Principles and problems in information collection and evaluation; impartial gathering and evaluation of data. Crime scene search and recording; collection and preservation of physical evidence; scientific aids; *modus operandi;* sources of information; interviewing; follow-up and case preparation.

LENF 230 (030). CRIMINAL LAW IN ACTION. (3)
Law as one of the methods of social control. Criminal law: its nature, sources, and types; theories and historical developments. Behavioral and legal aspects of criminal acts. Classification and analysis of selected criminal offenses.

LENF 234 (031). CRIMINAL PROCEDURE AND EVIDENCE. (3)
Prerequisite, LENF 230. General principles and theories of criminal procedure. Due process. Arrest, search and seizure. Recent developments. Study and evaluation of evidence and proof.

LENF 330 (120). CONTEMPORARY LEGAL POLICY ISSUES. (3)
Prerequisite, LENF 230 and 234 or equivalent. In-depth examination of selected topics. Criminal responsibility. Socio-legal policy alternatives with regard to deviance. Law enforcement procedures for civil law and similar legal problems. Admissibility of evidence. Representation. Indigent's right to counsel.

LENF 340 (140). CONCEPTS OF LAW ENFORCEMENT ADMINISTRATION. (3)
Prerequisite, LENF 100 or equivalent. An introduction to concepts of organization and management as these relate to law enforcement. Principles of structure, process, policy and procedure, communication and authority, division of work and organizational controls. Human element in the organization. Informal interaction and bureaucracy.

LENF 350 (130). LAW ENFORCEMENT-COMMUNITY RELATIONS. (3)
Prerequisite, LENF 100 or equivalent. Examination of factors contributing to cooperation or friction between law enforcement personnel and the community, with emphasis on minority groups, political pressures and cultural problems. Community organization and social responsibility of law enforcement.

LENF 398 (191). LAW ENFORCEMENT FIELD TRAINING. (1-6)
Prerequisite, junior standing. Supervised field training in law enforcement agencies as a structured and focused experience. The student, in consultation with his advisor, will select his particular area of interest and will be responsible to his advisor for continued contact and required report.

LENF 399 (189). DIRECTED INDEPENDENT RESEARCH. (1-3)
Prerequisite, senior standing. Supervised individual research and study: library and field research, surveys, special local problems.

LENF 444 (150). ADVANCED LAW ENFORCEMENT ADMINISTRATION. (3)
Prerequisite, LENF 340 or consent of instructor. The structuring of manpower, material, and systems to accomplish the major goals of social control. Personnel and systems management. Political controls and limitations on authority and jurisdiction.

LENF 460 (160). INDUSTRIAL AND RETAIL SECURITY ADMINISTRATION. (3)
Prerequisite, LENF 100, 220 and 340 or consent of instructor. The origins of contemporary private security systems. Organization and management of industrial and retail protective units.

DANCE

Professor and Chairman: Madden.
Associate Professor: Rosen.
Assistant Professor: Weaver.
Visiting Lecturers: Freivogel and Nicks.
Instructors: Brunner, Justice (P.T.), Kucen, Larsen, Reynolds, Sheppard, Sinclair, Williams, Witt.

The offerings in the Department of Dance are intended to serve the needs of students who wish

to make dance their major effort and also to provide opportunity for those students who would like to explore the role of dance as an art form. Courses serve to develop knowledge of different cultures and arts by studying the place of dance in diverse societies, and in relation to other art forms. Guest artists are scheduled throughout the year, and from time to time a resident artist is teaching.

For those students who choose to major in dance, the department provides courses of training which prepare them for performance, choreography, and to continue studies of dance and related arts at the graduate level. It is also possible for the student to choose dance history, criticism or dance archives as a career. The curriculum also includes music for dance and rhythmic invention as well as related theatre subjects.

The Bachelor of Arts degree is given by the College of Arts and Sciences and is awarded to those whose interest is basically in the cultural, performing and composing aspects of the dance and teaching on the college level. The Bachelor of Science degree with a major in teaching is offered in the College of Education.

It should be noted that the dance major programs are demanding ones of faculty and students alike, implying the giving of time, energy and dedication to the program. Students prepared to meet this challenge are warmly welcomed.

Courses in dance theory, literature and technique are open to all students who have completed the specified prerequisites, acquired the equivalent experience or secured the permission of the chairman of the department. Apprentice Groups I and II, and the Performing Company are open to qualified students.

THE BACHELOR OF ARTS DEGREE

The Department requirement includes a core program of 14 hours in dance techniques and 24 in theory and literature. Dance majors are required to take 12 hours in related disciplines, and to be in a technique course each semester.

No course with a grade of less than C may be applied toward the fulfillment of the course requirements for a major in dance.

Students are placed in technique classes according to their level of achievement and progress.

DANC 100, 104 (052, 054). DANCE TECHNIQUES. (2, 2)
First and second semesters. DANC 100: a study of dance movement in terms of placement, rhythm, dynamics, space, improvisation, and dance phrases. DANC 104: further development of the materials in DANC 100. Prerequisite, DANC 100 or equivalent.

DANC 102 (050). RHYTHMIC INVENTION FOR DANCE. (2)
First and second semester. Three hours a week. A course designed to show how rhythm affects the total dance movement picture and develops the dancer's rhythmic awareness and response. Understanding of rhythmic principles, movement isolation, design, phrasing, syncopation.

DANC 199 (090). WORKSHOP. (1-2)
First and second semesters. Admission by consent of instructor. Planning, choreography and presentation of demonstrations and concerts. May be repeated for credit until 6 credits have been earned.

DANC 200 (032). INTRODUCTION TO DANCE. (3)
First and second semesters. Three lectures a week. A study of dance as a form of communication and as an art form. The course includes a survey of the theories and styles of dance, and of their relationships to other art forms. Lectures will be supplemented by observations, films, and guest speakers. May be taken to fulfill the 3 semester hours requirement in fine arts or philosophy of the General Education requirement.

DANC 208 (060). ELEMENTARY DANCE COMPOSITION. (3)
First and second semesters. Prerequisite, DANC 104 or equivalent. The study of basic principles of dance composition in terms of space, time, dynamics, and movement invention. The development of critical awareness and judgment with regard to composing.

DANC 248, 348 (055, 057). DANCE TECHNIQUES. (2, 2)
First and second semesters. Prerequisite, DANC 104 or equivalent. DANC 248, a study of dance techniques and styles. DANC 348, further development of materials in DANC 248. Prerequisite, DANC 248 and 208 or equivalent.

DANC 265 (190). NOTATION. (3)
First and second semesters. Prerequisite, DANC 102 or equivalent. Movement analysis for purposes of recording dance; notation fundamentals; elementary writing of technique; reading of simple folk, modern and ballet studies.

DANC 284 (084). MOVEMENT FOR THE THEATRE. (3)
First and second semesters. Lecture and laboratory. Prerequisite, one semester of dance technique. Movement for actors, dancers, directors, singers in the theatre. Dynamics, qualities, styles, and space as related to movement on the stage.

DANC 305 (114). DEVELOPMENT OF DANCE PROGRESSION. (3)
First and second semesters. Prerequisite, DANC 208 or equivalent. The application and building of dance progression both in terms of dance techniques and in choreographic studies. Students have the opportunity to observe and assist the instructor in conducting lower-level dance classes.

DANC 389 (080). DANCE TECHNIQUES. (2)
First and second semesters. Prerequisite, DANC 348 or equivalent. Continuation of DANC 378 in further advanced form. May be repeated for credit.

DANC 400 (100). ADVANCED CHOREOGRAPHIC FORMS. (3)
First and second semesters. Prerequisite, DANC 208 or equivalent and adequate dance technique. Lectures and studio work in modern sources as they apply to dance. Solo and group choreography.

DANC 470 (170). CREATIVE DANCE FOR CHILDREN. (3)
First and second semesters. Prerequisite, DANC 208 or equivalent. Directing the essential elements of dance to the level of the child's experience and facilitating the creative response. The development of movement into simple forms to serve as a symbol of individual expression.

DANC 480 (180). DANCE PRODUCTION. (3)
First and second semesters. Prerequisites, DANC 400 or equivalent and an adequate understanding of dance techniques. Advanced choreography. Independent work with periodic criticism.

DANC 482, 483 (182, 183). HISTORY OF DANCE. (3, 3)
The development of dance from primitive to contemporary times and the relationship of dance forms to patterns of culture. DANC 482, the Primitive period through the Middle Ages. DANC 483, the Renaissance period to the present times. May be taken to fulfill the 3 semester hours requirement in fine arts or philosophy of the General Education requirement.

DANC 484 (184). THEORY AND PHILOSOPHY OF DANCE. (3)
First and second semesters. The study of the theories, philosophies and aesthetics of dance. Investigation of form, content and structure. Interrelationships of the arts, and their role in man's world. May be taken to fulfill the 3 semester hours requirement in fine arts or philosophy of the General Education requirement.

DANC 489 (104). ETHNIC STYLES. (3)
First and second semesters. Prerequisite, DANC 104. Lecture and activity in styles expressive of various cultures. May be repeated for credit by permission of instructor.

DANC 492 (192). PERCUSSION AND MUSIC SOURCES FOR DANCE. (3)
First and second semesters. Prerequisite, DANC 102 or equivalent. Techniques of percussion playing, and its use as dance accompaniment. Learning to use the instruments in composition and improvisation. Study of music sources for dance.

DANC 498 (194). DIRECTED STUDIES IN DANCE. (1-6)
First and second semesters. Hours arranged. For advanced students who have the permission of the chairman of the Department of Dance.

DANC 499 (195). ADVANCED DANCE TECHNIQUE. (2)
Prerequisite, DANC 389 or equivalent. Continuation of DANC 389 in further advanced form.

ECONOMICS

Students registered in the College of Arts and Sciences may major in economics. During the freshman and sophomore years prospective economics majors should consult with their lower division advisor in Arts and Sciences concerning preparation for the major. Normally ECON 110—Economic Developments (3) is taken during the freshman year and ECON 201, 203—Principles of Economics (3, 3), during the sophomore year. Economics majors are required to take six hours of mathematics.

Juniors and seniors are advised by the faculty of the Department of Economics, which is administered in the College of Business and Public Administration. In addition to the nine lower division credits listed above, economics majors must complete a minimum of 27 credits with an average grade of not less than C. ECON 401—National Income Analysis (3); ECON 403—Advanced Economic Principles (3); and either BSAD 230—Business Statistics I (3) or ECON 421—Quantitative Methods in Economics (3) are required. Other courses to meet the requirements of the major are to be selected with the aid of a faculty advisor. Additional information about the curriculum in economics may be obtained at the departmental office.

ENGLISH LANGUAGE AND LITERATURE

Professor and Chairman: Freedman.

Assistant Professor and Associate Chairman: Howard.

Professors: Bode, Cooley, Harman (Emerita), Hovey, Lutwack, McManaway, Manning, Mish, Murphy, Myers, Panichas, Russell, Whittemore, Zeeveld.

Associate Professors: Andrews (Emerita), Barnes (representative of University College), Barry, Birdsall, Brown, Bryer, Cooper, Fleming, Gravely, Herman, Houppert, Jellema, Kinnaird, Lawson, Peterson, Perloff, Portz, Salamanca, D. Smith, G. Smith, Thorberg, Vitzthum, Ward, Wilson.

Assistant Professors: Beauchamp, Cate, Coulter, Dunn, Fry, Greenwod, G. Hamilton, Holton, James, Kenney, Kimble, Kleine, Kolker, Levinson, Martin, Miller, Moore, Quigley, Rowe, Rutherford, Salz, Spurgeon, Steinberg, Swigger, Tinsley, Tyson, VanEgmond, Walt, Weigant.

Instructors: Demaree, Detrick, Ference (P.T.), D. Hamilton (P.T.), Potash (P.T.), Stevenson, Townsend, Trousdale (P.T.).

The English major requires 30 credits, suitably distributed as indicated in departmental announcements, beyond the General Education requirements. A student may pursue a major with emphasis in English, American or Comparative Literature; in folklore, creative writing, or in linguistics; or in preparation for secondary school teaching. Students interested in secondary teaching should make it known to the department as early in their college career as possible.

No course with a grade less than C may be used to satisfy major requirements.

In selecting minor or elective subjects, students majoring in English, particularly those who plan to do graduate work, should give special consideration to courses in French, German, Latin, philosophy, and history.

HONORS

The Department of English offers an honors program, primarily for majors but open to others with the approval of the Departmental Honors Committee. Interested students should ask for detailed information from an English department advisor no later than the beginning of their junior year.

ENGLISH

ENGL 101, 171 or HONR 101 is prerequisite to courses numbered 201 through 212.

ENGL 101 (001). COMPOSITION. (3)
Required of freshmen. See ENGL 171. The study and application of rhetorical principles in expository prose; frequent themes. (Staff)

ENGL 171 (021). HONORS COMPOSITION. (3)
May be elected by eligible students in place of ENGL 101 to satisfy General Education requirement. Survey of principles of composition, rhetoric, and techniques of research; reading in essays, short stories, poetry; frequent themes. (Staff)

ENGL 201 (003). WORLD LITERATURE. (3)
Fulfills part of the General Education requirement. See ENGL 271. Homer to the Renaissance, foreign classics being read in translation. (Staff)

ENGL 202 (004). WORLD LITERATURE. (3)
Fulfills part of the General Education requirement. See ENGL 272. Shakespeare to the present, foreign classics being read in translation. (Staff)

ENGL 211 (055). ENGLISH LITERATURE FROM THE BEGINNINGS TO 1800. (3)
Fulfills part of the General Education requirement. (Staff)

ENGL 212 (056). ENGLISH LITERATURE FROM 1800 TO THE PRESENT. (3)
Fulfills part of the General Education requirement. (Staff)

ENGL 221 (057). AMERICAN LITERATURE, BEGINNING TO 1865. (3)
Fulfills part of the General Education requirement. (Staff)

ENGL 222 (058). AMERICAN LITERATURE, 1865 TO THE PRESENT. (3)
Fulfills part of the General Education requirement. (Staff)

ENGL 241 (009). INTRODUCTION TO NARRATIVE LITERATURE. (3)
Prerequisite, ENGL 101 or 171. An intensive study of representative stories, with lectures on the history and technique of the short story and other narrative forms. Fulfills part of the General Education requirement. (Staff)

ENGL 242 (015). READINGS IN BIOGRAPHY. (3)
An analytical study in the form and technique of biographical writing in Europe and America. Fulfills part of the General Education requirement. (Ward)

ENGL 243 (030). INTRODUCTION TO POETRY AND POETICS. (3)
Fulfills part of the General Education requirement. (G. Smith, Jellema)

ENGL 271 (033). HONORS WORLD LITERATURE. (3)
May be elected by eligible students in place of ENGL 201 to satisfy General Education requirement. Homer to the Renaissance, foreign classics being read in translation. (Staff)

ENGL 272 (034). HONORS WORLD LITERATURE. (3)
May be elected by eligible students in place of ENGL 202 to satisfy General Education requirement. Shakespeare to the present, foreign classics being read in translation. (Staff)

ENGL 280 (105). INTRODUCTION TO LINGUISTICS. (3)
Listed also as LING 100 and ANTH 371.

ENGL 291 (014). EXPOSITORY WRITING. (3) (Staff)

ENGL 292 (010). COMPOSITION AND LITERARY TYPES. (3)
Not open to students who have taken ENGL 171. A study of literary genres with writing based on the readings. Fulfills part of the General Education requirement. (Staff)

ENGL 293 (007). TECHNICAL WRITING. (2) (Staff)

ENGL 294 (012). INTRODUCTION TO CREATIVE WRITING. (3)
Additional prerequisite, sophomore standing. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Two courses from ENGL 201, 202, 211, 212, 221, 222, 241, 242, 243, 271, and 272 are prerequisite to courses numbered 401 through 499.

ENGL 401 (109). ENGLISH MEDIEVAL LITERATURE IN TRANSLATION. (3) (Birdsall, Herman)

ENGL 402 (104). CHAUCER. (3) (Steinberg, Rutherford)

ENGL 403, 404 (115, 116). SHAKESPEARE. (3, 3) (Barry, McManaway, Zeeveld)

ENGL 405 (117). THE MAJOR WORKS OF SHAKESPEARE. (3) (Staff)

ENGL 407, 411 (113, 112). LITERATURE OF THE RENAISSANCE. (3, 3) (Houppert, Spurgeon)

ENGL 412 (122). LITERATURE OF THE SEVENTEENTH CENTURY, 1600-1660. (3) (Murphy, Mish, Wilson, G. Hamilton)

ENGL 414 (121). MILTON. (3) (Murphy, Freedman, G. Hamilton, Wilson)

ENGL 415 (123). LITERATURE OF THE SEVENTEENTH CENTURY, 1660-1700. (3) (Wilson)

ENGL 416, 417 (125, 126). LITERATURE OF THE EIGHTEENTH CENTURY. (3, 3) (Saltz, Tyson, Myers)

ENGL 418, 419 (141, 142). MAJOR BRITISH WRITERS. (3, 3)
Two writers studied intensively each semester. (Staff)

ENGL 420, 421 (129, 130). LITERATURE OF THE ROMANTIC PERIOD. (3, 3) (Howard, Kolker, G. Smith, Kinnaird)

ENGL 422, 423 (134, 135). LITERATURE OF THE VICTORIAN PERIOD. (3, 3) (Kenney, Kleine, Peterson, Brown, Cate)

ENGL 424 (136). LATE VICTORIAN AND EDWARDIAN LITERATURE. (3)
A study of the literary movements and techniques which effected the transition from Victorian to modern literature. (Cate, Peterson)

ENGL 430 (180). AMERICAN LITERATURE, BEGINNING TO 1810, THE COLONIAL AND FEDERAL PERIODS. (3) (Vitzthum, Weigant)

ENGL 431 (181). AMERICAN LITERATURE, 1810 to 1865, THE AMERICAN RENAISSANCE. (3) (Weigant, Martin, Vitzthum)

ENGL 432 (182). AMERICAN LITERATURE, 1865 to 1914, REALISM AND NATURALISM. (3) (Gravely, Thorberg)

ENGL 433 (183). AMERICAN LITERATURE, 1914 TO THE PRESENT, THE MODERN PERIOD. (3) (Lawson, Moore, Holton)

ENGL 434 (146) AMERICAN DRAMA. (3) (Barry, Bryer)

ENGL 435 (147). AMERICAN POETRY, BEGINNING TO THE PRESENT. (3) (Van Egmond, Holton)

ENGL 436 (148). THE LITERATURE OF AMERICAN DEMOCRACY. (3) (Barnes)

ENGL 438, 439 (155, 156). MAJOR AMERICAN WRITERS. (3, 3)
Two writers studied intensively each semester. (Staff)

ENGL 440 (152). THE NOVEL IN AMERICA TO 1910. (3) (Hovey, Thorberg)

ENGL 441 (153). THE NOVEL IN AMERICA SINCE 1910. (3) (Dunn, Hovey, Thorberg)

ENGL 442 (154). LITERATURE OF THE SOUTH. (3)
A historical survey, from eighteenth-century beginnings to the present. (Moore, Lawson)

ENGL 443 (167). AFRO-AMERICAN LITERATURE. (3)
An examination of the literary expression of the Negro in the United States, from its beginning to the present. (Naughton)

ENGL 445 (143). MODERN POETRY. (3) (Whittemore, Van Egmond, Perloff, Fleming, Jellema)

ENGL 449 (172). PLAYWRITING. (3) (Fleming)

ENGL 450, 451 (110, 111). ELIZABETHAN AND JACOBEAN DRAMA. (3, 3) (Barry, D. Smith, Spurgeon, D. Hamilton)

ENGL 452 (120). ENGLISH DRAMA FROM 1660 TO 1800. (3) (D. Smith)

ENGL 453 (175). LITERARY CRITICISM. (3) (Trousdale, Lutwack)

ENGL 454 (144). MODERN DRAMA. (3) (Barry, Tinsley, Kimble, Freedman, Bryer)

ENGL 455, 456 (139, 140). THE ENGLISH NOVEL. (3, 3) (Ward, Kenney, Kleine, Peterson)

ENGL 457 (145). THE MODERN NOVEL. (3) (Russell, Perloff, Panichas, Lawson, Holton)

ENGL 460 (157). INTRODUCTION TO FOLKLORE. (3) (Fry, Birdsall)

ENGL 461 (158). FOLK NARRATIVE. (3)
Studies in legend, tale and myth. Prerequisite, ENGL 460. (Birdsall)

ENGL 462 (159). FOLKSONG AND BALLAD. (3)
Prerequisite, ENGL 460. (Glazer)

ENGL 463 (165). AMERICAN FOLKLORE. (3)
Prerequisite, ENGL 460. An examination of American folklore in terms of history and regional folk cultures. Exploration of collections of folklore from various areas to reveal the difference in regional and ethnic groups as witnessed in their oral and literary traditions. (Fry)

ENGL 464 (166). AFRO-AMERICAN FOLKLORE AND CULTURE. (3)
An examination of the culture of the Negro in the United States in terms of history (antebellum to the present)

and social changes (rural to urban). Exploration of aspects of Negro culture and history via oral and literary traditions and life histories. (Fry)

ENGL 465 (168). URBAN FOLKLORE. (3)
Prerequisite, ENGL 460. An examination of the folklore currently originating in white, urban, American culture. (Birdsall)

ENGL 470, 471 (190, 191). HONORS CONFERENCE AND READING. (1, 1)
Second semester. Prerequisite, candidacy for honors in English. Candidates will take ENGL 470 in their junior year and ENGL 471 in their senior year. (Staff)

ENGL 472 (195). INDEPENDENT RESEARCH IN ENGLISH. (1-3)
This course is designed to provide qualified majors in English an opportunity to pursue specific English readings under the supervision of a member of the department. Restricted to undergraduates. (Staff)

ENGL 473 (199). SENIOR PRO-SEMINAR IN LITERATURE. (3)
Open only to seniors. First semester. Required of candidates for honors and strongly recommended to those who plan to do graduate work. Individual reading assignments; term paper. (Staff)

ENGL 479 (179). SELECTED TOPICS IN ENGLISH AND AMERICAN LITERATURE. (3) (Staff)

ENGL 481 (008). INTRODUCTION TO ENGLISH GRAMMAR. (3)
A brief review of traditional English grammar and an introduction to structural grammar, including phonology, morphology and syntax. (James, Staff)

ENGL 482 (101). HISTORY OF THE ENGLISH LANGUAGE. (3) (Birdsall, James)

ENGL 483 (107). AMERICAN ENGLISH. (3) (Miller)

ENGL 484 (108). ADVANCED ENGLISH GRAMMAR. (3)
Credit may not be granted in both ENGL 484 and LING 402. (James)

ENGL 485 (161). ADVANCED ENGLISH STRUCTURE. (3) (Miller)

ENGL 486 (102). OLD ENGLISH. (3) (Rutherford)

ENGL 493 (160). ADVANCED EXPOSITORY WRITING. (3) (Beauchamp, Herman, Walt, Trousdale, Stevenson)

ENGL 498 (170). CREATIVE WRITING. (3) (Salamanca, Van Egmond, Fleming, Jellema, Holton)

ENGL 499 (171). ADVANCED CREATIVE WRITING. (3) (Fleming, Salamanca)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

ENGL 601 (201). BIBLIOGRAPHY AND METHODS. (3) (Staff)

ENGL 602 (202). MIDDLE ENGLISH. (3) (Staff)

ENGL 620 (260). SPECIAL STUDIES IN ENGLISH LITERATURE: THE MEDIEVAL PERIOD TO 1500. (3) (Staff)

ENGL 621 (261). SPECIAL STUDIES IN ENGLISH LITERATURE: RENAISSANCE LITERATURE. (3) (Staff)

ENGL 622 (262). SPECIAL STUDIES IN ENGLISH LITERATURE: SEVENTEENTH-CENTURY LITERATURE. (3) (Staff)

ENGL 623 (263). SPECIAL STUDIES IN ENGLISH LITERATURE: EIGHTEENTH-CENTURY LITERATURE. (3) (Staff)

ENGL 624 (264). SPECIAL STUDIES IN ENGLISH LITERATURE: ROMANTIC LITERATURE. (3) (Staff)

ENGL 625 (265). SPECIAL STUDIES IN ENGLISH LITERATURE: VICTORIAN LITERATURE. (3) (Staff)

ENGL 626 (266). SPECIAL STUDIES IN AMERICAN LITERATURE: AMERICAN LITERATURE BEFORE 1865. (3) (Staff)

ENGL 627 (267). SPECIAL STUDIES IN AMERICAN LITERATURE: AMERICAN LITERATURE SINCE 1865. (3) (Staff)

ENGL 718 (204). SEMINAR IN MEDIEVAL LITERATURE. (3) (Staff)

ENGL 719 (206). SEMINAR IN RENAISSANCE LITERATURE. (3) (Staff)

ENGL 728 (210). SEMINAR IN SEVENTEENTH-CENTURY LITERATURE. (3) (Staff)

ENGL 729 (212). SEMINAR IN EIGHTEENTH-CENTURY LITERATURE. (3) (Staff)

ENGL 738, 739 (214, 215). SEMINAR IN NINETEENTH-CENTURY LITERATURE. (3, 3) (Staff)

ENGL 748 (225, 227). SEMINAR IN AMERICAN LITERATURE. (3) (Staff)

ENGL 749 (241). STUDIES IN TWENTIETH-CENTURY LITERATURE. (3) (Staff)

ENGL 758 (216). LITERARY CRITICISM. (3) (Staff)

ENGL 759 (218). SEMINAR IN LITERATURE AND THE OTHER ARTS. (3) (Staff)

ENGL 768 (244). STUDIES IN DRAMA. (3) (Staff)

ENGL 769 (245). STUDIES IN FICTION. (3) (Staff)

ENGL 778 (257). SEMINAR IN FOLKLORE. (3) (Staff)

ENGL 799 (399). THESIS RESEARCH. (ARRANGED) (Staff)

ENGL 819 (302). SEMINAR IN THEMES AND TYPES IN ENGLISH LITERATURE. (3) (Staff)

ENGL 828 (303). SEMINAR IN THEMES AND TYPES IN AMERICAN LITERATURE. (3) (Staff)

ENGL 899 (499). DISSERTATION RESEARCH (ARRANGED) (Staff)

ENGLISH FOR FOREIGN STUDENTS

FOLA 001, 002. ENGLISH FOR FOREIGN STUDENTS.
An introduction to English usage, adapted to the needs of the non-English-speaking student. Pronunciation, spelling, syntax, the difference between English and various other languages are stressed. (Bridgers)

FRENCH AND ITALIAN LANGUAGES AND LITERATURE

Professor and Chairman: MacBain.
Professors: Bingham, Quynn (Emeritus), Rosenfield.
Visiting Professors: Daniel, Guyon, Monchoux.
Associate Professors: Demaitre, Hall, Tarica.
Assistant Professors: Bridgers, Fink, Gilbert, Hicks, Lebreton-Savigny, Salchenberger.
Lecturers: Lloyd-Jones, Meijer.
Visiting Lecturer: Puel.
Instructors: Abbate, Barrabini, Bondurant, Brachet, Brodsky, Christov, Deburghgraeve, Dubois, Eardley, Edmonds, Guieu, Lapov, Luiggi, Manning, Mazet, Quilici, Ragazzi, Thibault, Tubbs, Vaccarelli.

The department offers a major in French, which consists of 39 credits of French courses beyond the level of the foreign language requirement of the College of Arts and Sciences. The French major must complete eight of the following courses: FREN 201, 211, 221, 301, 302, 311, 312, 321, 322, and any five French courses numbered above 330. (Students intending to apply for admission to graduate programs in French in this department must take no less than four literature courses at the 400 level.) An average grade of C is the minimum acceptable in the major field. Students intending

to apply for teacher certification should consult the departmental director of Undergraduate Advising, Dr. Beatrice C. Fink, as early as possible in order to plan their programs accordingly.

HONORS

The department offers an honors program in French for students of superior ability. Honors work normally begins in the first semester of the junior year, but a qualified student may enter as early as the sophomore year or as late as the second semester of the junior year. Honors students are required to take at least two courses from those numbered 491H, 492H, and 493H together with 494H, Honors Independent Study, and 495H, Honors Thesis Research. Honors students must take a final comprehensive examination based on the honors reading list. Admission of students to the honors program, their continuance in the program and the final award of honors are the prerogative of the Departmental Honors Committee.

FRENCH

FREN 001 (000). ELEMENTARY FRENCH FOR GRADUATE STUDENTS. (Audit)
Intensive elementary course in the French language designed particularly for graduate students who wish to acquire a reading knowledge. (Hall)

FREN 111, 112 (001, 002). ELEMENTARY FRENCH. (3, 3)
Each semester; given as intensive course in summer session. Three recitations and one drill per week. Study of spoken and written language and development of the four language skills. (Tubbs)

FREN 113 (005). REVIEW OF ELEMENTARY FRENCH. (3)
Two recitations and two audio-lingual drills per week, or three recitations and one audio-lingual drill, depending on circumstances. Enrollment limited to students who, having taken placement examination, have failed to qualify for FREN 114. (Tubbs)

FREN 114, 115 (006, 007). INTERMEDIATE FRENCH. (3, 3)
Three recitations per week. Given as intensive course in summer session. Prerequisite, FREN 112 or equivalent or FREN 113. Study of linguistic structure, further development of audio-lingual and writing ability, and reading of literary texts with discussion in French. (Hall)

FREN 201 (NEW). REVIEW GRAMMAR AND COMPOSITION. (3)
Requirement: FREN 115, or course chairman's consent. An intensive review of major aspects of contemporary grammatical usage; training in comprehension; an introduction to guided composition. (Lloyd-Jones)

FREN 211 (NEW). PHONETICS AND SPOKEN FRENCH. (3)
Requirement: FREN 115, or course chairman's consent. Not open to native speakers of French. Introduction to the French phonetic system, with practice in the spoken language; International Phonetic Alphabet; intonation. (Barrabini)

FREN 221 (NEW). READINGS IN MODERN LITERATURE. (3)
Requirement: FREN 115, or course chairman's consent. An introduction to French literature from the mid-nineteenth century to the present day, through the critical analysis of complete texts representative of their genre. Discussion and examinations in English. (Tarica)

FREN 221H (NEW). READINGS IN MODERN LITERATURE (Honors). (3)
Requirement: FREN 115, or course chairman's consent. An introduction to French literature from the mid-nineteenth century to the present day, through the critical analysis of complete texts representative of their genre. Discussion and examinations in French. (Staff)

FREN 301 (NEW). COMPOSITION AND STYLE. (3)
Requirement: FREN 201, or course chairman's consent. An introduction to the techniques of the *dissertation générale;* grammatical analysis; free composition. (Lloyd-Jones)

FREN 302 (NEW). ADVANCED COMPOSITION AND STYLE. (3)
Requirement: FREN 301, or course chairman's consent. Training in the art of translation; *dissertation générale;* analysis of the role of language in literature. (Lloyd-Jones)

FREN 311 (NEW). INTERMEDIATE SPOKEN FRENCH. (3)
Requirement: FREN 211, or course chairman's consent. Not open to native speakers of French. Vocabulary development to the level of the contemporary French press; practical phonetics and intonation practice. (Barrabini)

FREN 312 (NEW). ADVANCED SPOKEN FRENCH. (3)
Requirement: FREN 311, or course chairman's consent. Not open to native speakers of French. Advanced conversation on multiple aspects of contemporary French culture; further practical phonetics and intonation practice. (Barrabini)

FREN 321 (NEW). READINGS IN ENLIGHTENMENT AND ROMANTIC LITERATURE. (3)
Requirement: FREN 221, or course chairman's consent. An introduction to French literature from the early eighteenth to the mid-nineteenth centuries, through the critical analysis of complete texts representative of their genre. Discussion and examinations in English. (Fink)

FREN 321H (NEW). READINGS IN ENLIGHTENMENT AND ROMANTIC LITERATURE (Honors). (3)
Requirement: FREN 221, or course chairman's consent. An introduction to French literature from the early eighteenth to the mid-nineteenth centuries, through the critical analysis of complete texts representative of their genre. Discussion and examinations in French. (Staff)

FREN 322 (NEW). READINGS IN RENAISSANCE AND CLASSICAL LITERATURE. (3)
Requirement: FREN 321, or course chairman's consent. An introduction to French literature from the mid-sixteenth to the late seventeenth centuries, through the critical analysis of complete texts representative of their genre. Discussion and examinations in English. (Meijer)

FREN 322H (NEW). READINGS IN RENAISSANCE AND CLASSICAL LITERATURE (Honors). (3)
Requirement: FREN 321, or course chairman's consent. An introduction to French literature from the mid-sixteenth to the late seventeenth centuries, through the critical analysis of complete texts representative of their genre. Discussion and examinations in French. (Staff)

FREN 331, 332 (171, 172). FRENCH CIVILIZATION. (3, 3)
French life, customs, culture, traditions. The historical development; present-day France. (Lebreton-Savigny, Meijer)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

FREN 400 (101). APPLIED LINGUISTICS. (3)
The nature of applied linguistics and its contribution to the effective teaching of foreign languages. Comparative study of English and French, with emphasis upon points of divergence. Analysis, evaluation and construction of related drills. (Staff)

FREN 401 (NEW). INTRODUCTION TO STYLISTICS. (3)
Requirement: FREN 302, or course chairmen's consent. Comparative stylistic analysis; detailed grammatical analysis; translation. (Lloyd-Jones)

FREN 405 (104). EXPLICATION DE TEXTES. (3)
Oral and written analysis of short literary works, or of excerpts from longer works chosen for their historical, structural, or stylistic interest, with the purpose of training the major to understand literature in depth and to make mature esthetic evaluations of it. (Fink)

FREN 411, 412 (107, 108). INTRODUCTION TO MEDIEVAL LITERATURE. (3, 3)
French literature from the ninth through the fifteenth century. *La chanson épique, le roman courtois, le lai; la littérature bourgeoise, le théâtre, la poésie lyrique.* (Hicks, Lloyd-Jones)

FREN 421, 422 (111, 112). FRENCH LITERATURE OF THE SIXTEENTH CENTURY. (3, 3)
The Renaissance in France: Humanism, Rabelais, Calvin, the Pléiade, Montaigne, Baroque poetry. (Lloyd-Jones, Meijer)

FREN 431, 432 (115, 116). FRENCH LITERATURE OF THE SEVENTEENTH CENTURY. (3, 3)
Descartes, Pascal, Corneille, Racine; the remaining great classical writers, with special attention to Molière. (Rosenfield)

FREN 441, 442 (125, 126). FRENCH LITERATURE OF THE EIGHTEENTH CENTURY. (3, 3)
Development of the philosophical and scientific movement; Montesquieu, Voltaire, Diderot, Rousseau. (Bingham, Fink)

FREN 451, 452 (131, 132). FRENCH LITERATURE OF THE NINETEENTH CENTURY. (3, 3)
Drama and poetry from Romanticism to Symbolism; the major prose writers of the same period. (Gilbert, Lebreton-Savigny)

FREN 461 (143). STUDIES IN TWENTIETH CENTURY LITERATURE: THE EARLY YEARS. (3)
French poetry, theater and the novel during the age of Proust and Gide. (Demaitre, Tarica)

FREN 462 (144). STUDIES IN TWENTIETH CENTURY LITERATURE: MID-CENTURY WRITERS. (3)
Modern French poetry, theater and the novel, with special emphasis on the literature of anxiety and Existentialism. (Demaitre, Tarica)

FREN 463 (145). STUDIES IN TWENTIETH CENTURY LITERATURE: THE CONTEMPORARY SCENE. (3)
French writers and literary movements since about 1950, with special emphasis on new forms of the novel and theater. (Demaitre, Tarica)

FREN 488, 489 (181, 182). PRO-SEMINAR IN GREAT LITERARY FIGURES. (3, 3)
Each semester a specialized study will be made of one great French writer chosen from some representative literary period or movement since the Middle Ages. (Staff)

FREN 491H, 492H, 493H (195H, 196H, 197H). HONORS READING COURSES. (3, 3, 3)
Supervised readings to be taken normally only by students admitted to the Honors Program: 491H is poetry; 492H is the novel; 493H is drama. (Staff)

FREN 494 (198H). HONORS INDEPENDENT STUDY. (3)
Honors Independent Study involves guided readings based on an Honors reading list and tested by a 6 hour written examination. Honors 494 and 495 are required to fulfill the departmental Honors requirement in addition to two out of the following: 491H, 492H, 493H. Open only to students admitted to the departmental Honors Program. (Staff)

FREN 495H (199H). HONORS THESIS RESEARCH. (3)
Honors Thesis Research involves the writing of a paper under the direction of a professor in this department and an oral examination. Honors 494 and 495 are required to fulfill the departmental Honors requirement in addition to two out of the following: 491H, 492H, 493H. Open only to students admitted to the departmental Honors Program. (Staff)

FOR GRADUATES

The entire program of graduate courses is under review at time of printing. Students should consult the Department directly.

ITALIAN

ITAL 111, 112 (001, 002). ELEMENTARY ITALIAN. (3)
Three recitations and one laboratory hour per week. Elements of grammar and exercises in translation. (Salchenberger)

ITAL 114, 115 (006, 007). INTERMEDIATE ITALIAN. (3, 3)
Three recitations per week. Prerequisite, ITAL 112 or equivalent. Reading of texts designed to give some knowledge of Italian life, thought and culture. (Salchenberger)

ITAL 121, 122 (008, 009). ACCELERATED ITALIAN. (3, 3)
Open only to students who have fulfilled language requirements in French, Spanish or Portuguese, or with permission of department chairman. An intensive beginning course in the fundamentals of Italian grammar to develop a high degree of skill in reading Italian. Must be taken in sequence. Cannot be used to satisfy college language requirements. (Salchenberger)

ITAL 201 (012). CONVERSATION AND COMPOSITION. (3)
Prerequisite, ITAL 115. A practical language course recommended for all students continuing in Italian. May be taken concurrently with ITAL 251. (Salchenberger)

ITAL 251 (011). INTRODUCTION TO ITALIAN LITERATURE. (3)
Prerequisite, ITAL 115. Required of all students who continue in advanced courses of the department with the exception of superior students who are permitted to bypass an introduction to Italian literature. Conducted in Italian. Reading of literary texts, discussion and brief essays. (Salchenberger)

ITAL 351, 352 (075, 076). SURVEY OF ITALIAN LITERATURE. (3, 3)
Prerequisite, ITAL 115 or equivalent. Basic survey of history of Italian literature. (Salchenberger)

ITAL 410 (111). THE ITALIAN RENAISSANCE. (3)
A study of major trends of thought in Renaissance literature, philosophy, art, and science. (Salchenberger)

GEOGRAPHY

Geography is a recognized major field in Arts and Sciences leading to the B.A. degree, although the department is administered by the College of Business and Public Administration. Freshman and sophomores wishing to major in geography should consult their lower division advisors and the Department of Geography. The following courses are required for a major: GEOG. 200—Introduction to Physical Geography (3); GEOG. 202—Introduction to Cultural Geography (3); GEOG. 203—Introduction to Economic Geography (3); and GEOG. 300—Introduction to Research and Writing in Geography (3). In addition, the major must take three hours of field study from the courses numbered GEOG. 380 and 384 and one regional course. The remainder of the 33 hour minimum for the major can be made up of elective systematic and technique courses. GEOG. 100—Introduction to Geography (3) taken as part of the University's General Education program does not count toward the 33 hour major requirement. Descriptions of courses in geography will be found in the section of the College of Business and Public Administration.

For supporting course requirements in other departments please contact an advisor in the Geography Department.

GERMANIC AND SLAVIC LANGUAGES AND LITERATURES

Professor and Chairman: Hering.
Professors: Dobert, Jones.
Associate Professor: Best.
Assistant Professors: Berry, Dulbe, Elder, Fleck, Hitchcock, Irwin, Knoche.
Lecturer: Kostovski.
Instructors: Apitz, Dvorak, Horowitz, Huebschman, Juran, Klapouchy, Logan, Ransick, Schmeissner, Thielke.

GENERAL

Two types of undergraduate majors are offered in both German and Russian: one for the general student or the future teacher, and the other for those interested in a rounded study of a foreign area for the purpose of understanding another nation through its literature, history, sociology, and other aspects. Both of these majors confer the B.A. degree. The department also offers M.A. and Ph.D. degrees in German language and literature.

An undergraduate major in either category consists of a total of 33 hours with a C average, beyond the basic Arts and Sciences language requirement.

In selecting minor or elective subjects, students majoring in German or Russian, particularly those who plan to do graduate work, should give special consideration to courses in French, Spanish, Latin, philosophy, history, and English.

LANGUAGE AND LITERATURE MAJOR:

GERMAN

German 221, which may be taken concurrently with German 321 or 322, is required unless waived by the head of the department. Specific minimum requirements in the program are: three courses in advanced language (one from each set: 301-302, 311-312, 401-402); two semesters of the survey of literature courses (321-322); six literature courses on the 400-level, two of which may be taken in comparative literature. Taking honors courses as substitute for the 400-level literature courses requires special permission from the head of the department and in no case may more than two honors courses be selected for this purpose.

RUSSIAN

The specific minimum requirements are: one from each set: 201-202, 301-302, 311-312, 401-402; two semesters of the survey of literature courses (321-322), plus 15 hours of literature courses on the 400-level.

FOREIGN AREA MAJOR:

GERMAN

Specific requirements in this major are: three courses in advanced language (one from each set: 301-302, 311-312, 401-402); a two semester survey (321-322); two courses in civilization (331-332); four courses in German literature on the 400-level, two of which may be replaced by Comparative Literature 401 and 402. Supporting courses should be selected in consultation with the student's advisor.

RUSSIAN

Specific requirements in this major are: three courses in advanced language (one from each set: 201-202, 301-302, 311-312); Russian 321 and 322; Russian 401 and 402; plus 12 hours of literature courses on the 400-level, two of which may be replaced by Comparative Literature 401 and 402. Supporting courses should be selected in consultation with the student's advisor.

HONORS

A student majoring in German or Russian who at the time of application has a general academic average of at least 3.0 and 3.5 or above in his major field, is eligible for admission to the honors program of the department. Application should be directed to the chairman of the Honors Committee. Honors work normally begins in the first semester of the junior year but a qualified student may enter as early as the sophomore year or as late as the second semester of the junior year.

Honors students are required to take two of the honors reading courses (491H, 492H, 493H) and the independent study course, 496H.

There will be a final comprehensive examination, covering the honors reading list, which must be taken by all graduating seniors who are candidates for honors. Admission of students to the honors program, their continuance in the program, and the final award of honors are the prerogative of the Departmental Honors Committee.

LOWER DIVISION COURSES

There are two tracks of elementary and intermediate courses in German. Track I consists of three semesters of four credits each (GERM 101, 102, 104) and Track II of four semesters of three credits each (GERM 111, 112, 114, 115). The language requirement of the College af Arts and Sciences is satisfied by passing either 104 or 115 or equivalent. Students with only one year of high school language may take courses 101 or 111 and 112 in that language for credit. Students who have had two or more years of German or Russian in high school and wish to continue with that language *must* take the placement exam.

Students who, as a result of the placement exam, place in 103 or 113 must complete 104 or 115. They may not take courses 101-102 or 111-112

for credit unless there has been a four-year lapse of time between their high school language course and their first college course in that language. Those who place above 104 or 115 have fulfilled the college requirement.

Transfer students with college credit have the option of continuing at the level for which they are theoretically prepared, of taking a placement examination, or of electing courses 103 or 113 for credit. If a transfer student takes 103 or 113 for credit, he may retain transfer credit *only* for the equivalent of course 101 or 111. A transfer student placing lower than his training warrants may ignore the placement but *DOES SO AT HIS OWN RISK*.

If a student has received a D in a course and completes the next higher course, he cannot go back to repeat the original D.

A student whose native language is taught at the university may not meet the college requirement by taking courses 101 through 312. There is a special option by which foreign students may offer a combination of FOLA 001 and 002 (English for Foreign Students) and 12 hours of English courses to satisfy both the arts and sciences English and foreign language requirements.

ELEMENTARY HONORS

Courses 102H and 112H in German (and 112H in Russian) are limited to specially approved candidates who have passed courses 101 or 111 with high grades and are recommended by their instructors. This will allow them to complete their requirement by completing either 102H or 115.

GERMAN

GERM 001 (000). ELEMENTARY GERMAN FOR GRADUATE STUDENTS. (AUDIT)
Intensive elementary course in the German language designed particularly for graduate students who wish to acquire a reading knowledge. (Elder)

GERM 101 (new). ELEMENTARY GERMAN. (4)
Introduction to basic structures and pronunciation. Four recitations per week and one hour of drill. Normally leads to 102, but gifted students may be recommended for 102H.

GERM 102 (new). ELEMENTARY GERMAN. (4)
Not given until Spring 1972.
Completion of basic structures with increased emphasis on reading and speaking skills. Normally leads to 104, but gifted students may be recommended for 104H.

GERM 102H (new). ELEMENTARY GERMAN, HONORS COURSE. (4)
Not given until Spring 1972.
Limited to students who have been recommended by their 101 instructor. An accelerated course of study with completion of basic structures. Emphasis upon reading as well as oral and written expression. Four recitations per week and one (optional) laboratory hour. Fulfills the language requirement with minimum grade of "B".

GERM 103 (new). REVIEW OF ELEMENTARY GERMAN. (4)
Not given until Spring 1972.
Limited to students who have had at least two years of high school German (or the equivalent) or who do not qualify for 104. Four recitations per week. Normally leads to 104, but gifted students may be recommended by their instructor for 104H.

GERM 104 (new). INTERMEDIATE LITERARY GERMAN. (4)
Not given until Fall 1972.
Extensive reading, discussion, and composition. Four recitations per week. (Completes Foreign Language requirement). Leads to GERM 201 or 221.

GERM 104H (new). INTERMEDIATE LITERARY GERMAN, HONORS COURSE. (4)
Not given until Fall 1972.
Limited to students who have been recommended by their instructor in 102 or 102H or 103. Continued emphasis on reading and writing with particular attention paid to speaking skills. Student normally continues with 201, 221, or 321.

GERM 104S (new). SCIENTIFIC GERMAN. (4)
Not given until Fall 1972.
Parallel course to 104 but with emphasis on scientific rather than literary texts, with emphasis solely on developing reading skills. Fulfills the Foreign Language requirement.

GERM 111, 112 (001, 002). ELEMENTARY GERMAN. (3, 3)
Each semester; given as intensive course in summer session. Three recitations and one audio-lingual drill per week. Study of linguistic structure. Extensive drill in pronunciation and conversation. (Logan)

GERM 112H (003H). ELEMENTARY GERMAN. HONORS COURSE. (3)
Three recitations and one audio-lingual drill per week. Enrollment limited to specially approved candidates from GERM 111. Students taking this course will normally continue in GERM 115.

GERM 113 (005). REVIEW OF ELEMENTARY GERMAN. (3)
Three recitations and one audio-lingual drill per week. Limited to students who, having taken placement examination, have failed to qualify for GERM 115. (Huebschman)

GERM 114, 115 (006, 007). INTERMEDIATE LITERARY GERMAN. (3, 3)
Three recitations per week. Given as intensive course in summer session. Prerequisite: GERM 112 or equivalent, or GERM 113, except that recommended students may enter GERM 115 from GERM 112H. Usually there will be an Honors section for qualified students. (Dvorak)

GERM 115H (007H). INTERMEDIATE LITERARY GERMAN. HONORS COURSE. (3) (Staff)

GERM 115S (008). SCIENTIFIC GERMAN. (3)
Prerequisite, GERM 114. Reading of technical and scientific prose. (Huebschman)

GERM 201 (012). CONVERSATION AND COMPOSITION. (3)
Prerequisite, GERM 115. A practical language course recommended for all students continuing in German. May be taken concurrently with GERM 221. (Elder)

GERM 221 (011). INTRODUCTION TO GERMAN LITERATURE. (3)
Prerequisite, GERM 115. Required of all students who continue in advanced courses, with the exception of superior students who are permitted to bypass an introduction to German literature. May be taken concurrently with GERM 201. (Elder)

FOR ADVANCED UNDERGRADUATES

GERM 301, 302 (071, 072). REVIEW GRAMMAR AND COMPOSITION. (3, 3)
Prerequisite: GERM 115 or equivalent. A thorough study of the more detailed points of German grammar with ample practice in composition. (Staff)

GERM 311, 312 (080, 081). ADVANCED CONVERSATION. (3, 3)
Prerequisite, GERM 115 or consent of instructor. For students who wish to develop fluency and confidence in speaking the language. (Dobert)

GERM 321, 322 (075, 076). SURVEY OF GERMAN LITERATURE. (3, 3)
Prerequisite, GERM 115 or equivalent. A survey of the chief authors and movements in German literature. (Knoche)

GERM 331, 332 (171, 172). GERMAN CIVILIZATION. (3, 3)
Study of the literary, educational, artistic traditions; great men, customs and general culture. (Elder)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

GERM 400 (191). BIBLIOGRAPHY AND METHODS. (3)
Second semester. Especially designed for German majors. (Jones)

GERM 401, 402 (103, 104). ADVANCED COMPOSITION. (3, 3)
Translation from English into German, free composition, letter writing. (Staff)

GERM 441, 442 (125, 126). GERMAN LITERATURE OF THE EIGHTEENTH CENTURY. (3, 3)
The main works of Klopstock, Wieland, Lessing, Herder, Goethe, Schiller. (Knoche)

GERM 451, 452 (131, 132). GERMAN LITERATURE OF THE NINETEENTH CENTURY. (3, 3)
Study of the literary movements from romanticism to naturalism. (Irwin)

GERM 461, 462 (141, 142). GERMAN LITERATURE OF THE TWENTIETH CENTURY. (3, 3)
Prose and dramatic writings from Gerhart Hauptmann to the present. Modern literary and philosophical movements will be discussed. (Best)

GERM 468, 469 (New). PROSEMINAR: SELECTED TOPICS IN GERMAN LITERATURE. (3, 3)
Specialized study of one great German writer or of relevant topics of literary criticism.

GERM 471, 472 (New). INTRODUCTION TO GERMAN PHILOLOGY. (3, 3)
An introduction to the study of Indo-European and Germanic philology. Lectures, reading and independent studies.

GERM 491H, 492H, 493H (195H, 196H, 197H). HONORS READING COURSE. (3, 3, 3)
Supervised reading to be taken normally only by students admitted to Honors Program: 491 is poetry; 492 is the novel; 493 is the drama. (Irwin)

GERM 496H (199H). HONORS SEMINAR. (3)
Required of all students in the Honors Program. Other students will be admitted on special recommendation. Conducted in German. Discussion of a central theme with related investigations by students. (Dobert)

FOR GRADUATES

See the *Graduate School catalog* for descriptions. The requirements of students will determine which courses will be offered.

GERM 600 (200). INTRODUCTION TO GERMAN STUDIES. (3) (Staff)

GERM 601 (201). HISTORY OF THE GERMAN LANGUAGE. (3) (Staff)

GERM 603 (203). GOTHIC. (3) (Staff)

GERM 604 (204). OLD HIGH GERMAN. (3) (Staff)

GERM 605, 606 (205, 206). MIDDLE HIGH GERMAN. (3 3) (Staff)

GERM 711, 712 (211, 212). LITERATURE OF THE SIXTEENTH AND SEVENTEENTH CENTURIES. (3, 3) (Staff)

GERM 745, 746 (224, 225). GOETHE AND HIS TIME. (3, 3) (Staff)

GERM 747 (226). SCHILLER. (3) (Staff)

GERM 751 (230). GERMAN ROMANTICISM. (3) (Staff)

GERM 754 (234). THE GERMAN DRAMA OF THE NINETEENTH CENTURY. (3) (Staff)

GERM 760 (250). THE GERMAN LYRIC. (3) (Staff)

GERM 765, 766 (255, 256). THE GERMAN NOVEL. (3, 3) (Staff)

GERM 767 (258). SEMINAR IN THE GERMAN NOVELLE. (3) (Staff)

GERM 799 (399). THESIS RESEARCH. (1-6) (Staff)

GERM 818, 819 (281, 282). READING COURSE. (3, 3) (Staff)

GERM 828, 829 (291, 292). SEMINAR. (3, 3) (Staff)

GERM 838, 839 (295, 296). SPECIAL STUDIES IN GERMAN LITERATURE. (3, 3) (Staff)

GERM 899 (499). DISSERTATION RESEARCH. (Arranged) (Staff)

RUSSIAN

RUSS 001 (000). ELEMENTARY RUSSIAN FOR GRADUATE STUDENTS. (Audit)
Graduate students should register as auditors only. Intensive elementary course in the Russian language designed particularly for graduate students who wish to acquire a reading knowledge.

RUSS 101 (new). ELEMENTARY RUSSIAN. (4)
Introduction to basic structures and pronunciation. Four recitations and one hour of drill per week.

RUSS 102 (new). ELEMENTARY RUSSIAN. (4)
Completion of basic structures with increased emphasis on reading and speaking skills.

RUSS 104 (new). INTERMEDIATE RUSSIAN. (4)
Extensive reading, discussion and composition. Four recitations per week. (Completes Foreign Language requirements).

RUSS 104S (new). SCIENTIFIC RUSSIAN. (4)
Parallel course to 104 but with emphasis on scientific rather than literary texts, with emphasis solely on developing reading skills. Fulfills the Foreign Language requirement.

RUSS 201, 202 (012, 013). CONVERSATION AND COMPOSITION. (3, 3)
Prerequisite, RUSS 104 or equivalent. A practical language course recommended for all students continuing in Russian. (Hitchcock)

RUSS 301, 302 (071, 072). REVIEW GRAMMAR AND COMPOSITION. (3, 3)
Prerequisite, RUSS 104 or equivalent. Designed to give a thorough training in the structure of the language; drill in Russian composition. (Hitchcock)

RUSS 311, 312 (080, 081). ADVANCED CONVERSATION. (3, 3)
Prerequisite, RUSS 201, 202, or consent of instructor. For students who wish to develop fluency and confidence in speaking the language. (Dulbe)

RUSS 321, 322 (075, 076). SURVEY OF RUSSIAN LITERATURE. (3, 3)
Prerequisite, RUSS 104 or equivalent. An elementary survey of Russian literature. (Hitchcock)

RUSS 361, 362 (061, 062). 19TH CENTURY RUSSIAN LITERATURE IN TRANSLATION. (3, 3)
Development of Russian literary thought in the Russian novel and short prose of the 19th century. Influence of Western literatures and philosophies considered.

RUSS 363 (New). SOVIET LITERATURE IN TRANSLATION. (3)
Russian literature since 1917, both as a continuation of pre-Revolutionary traditions and as a reflection of Soviet ideology.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

RUSS 401, 402 (103, 104). ADVANCED COMPOSITION. (3, 3) (Hitchcock)

RUSS 441 (125). RUSSIAN LITERATURE OF THE EIGHTEENTH CENTURY. (3) (Hitchcock)

RUSS 451, 452 (131, 132). RUSSIAN LITERATURE OF THE NINETEENTH CENTURY. (3, 3) (Dulbe)

RUSS 461, 462 (141, 142). SOVIET RUSSIAN LITERATURE. (3, 3) (Dulbe)

RUSS 465 (135). MODERN RUSSIAN POETRY. (3) (Dulbe)

RUSS 466 (136). MODERN RUSSIAN DRAMA. (3) (Berry)

RUSS 467 (137). MODERN RUSSIAN FICTION. (3) (Kostovski)

RUSS 470 (101). APPLIED LINGUISTICS. (3)
The nature of applied linguistics and its contributions to the effective teaching of foreign languages. Comparative study of English and Russian, with emphasis upon points of divergence. Analysis, evaluation and construction of related drills. (Hitchcock)

GOVERNMENT AND POLITICS

Students in Arts and Sciences may major in government and politics even though the department is administratively located in the College of Business and Public Administration. The Department of Government and Politics offers programs designed to prepare students for government service, politics, foreign assignments, teaching, a variety of graduate programs ranging from business to law, and for intelligent and purposeful citizenship.

Freshmen wishing to major in government and politics should consult their lower division advisors about preparation for the major; additional information about the government and politics program may be obtained at the departmental office.

Arts and Sciences students may pursue the general government curriculum or the more specialized international affairs curriculum. (Only BPA students may pursue a specialized curriculum in public administration.)

Government and politics majors must take a minimum of 36 semester hours in government and politics and may not count more than 42 hours in government toward graduation. No course with a grade less than C may be used to satisfy major requirements.

All GVPT majors are required to take GVPT 170—American Government (3); GVPT 100—Principles of Government and Politics (3); GVPT 220—Introduction to Political Behavior (3); and GVPT 441—History of Political Theory (3); or GVPT 442—Recent Political Theory (3). They must also take one course from three of the fields enumerated below (exclusive of Political Theory).

The government and politics fields are as follows: (1) American Government and Politics; (2) Comparative Government; (3) International Affairs; (4) Political Theory; (5) Public Administration; (6) Public Law; and (7) Public Policy and Political Behavior.

The distribution of courses within fields is as follows: I. American Government and Politics—GVPT 260, 399, 433, 460, 473, 475; II. Comparative Government—GVPT 280, 399, 417, 450, 454, 480, 481, 482, 483, 484, 485, 486; III. International Affairs—GVPT 300, 399, 401, 402, 403, 451, 452, 453, 454, 455, 457; IV. Political Theory—GVPT 240, 399, 441, 442, 443, 444, 445; V. Public Administration—GVPT 399, 410, 411, 412, 413, 414, 417, 460, 461, 462, 475; VI: Public Law—GVPT 399, 414, 431, 432, 433, 434; VII: Public Policy and Political Behavior—GVPT 399, 422, 426, 427, 429, 473, 474, 475, 479

In addition (a) GVPT majors (general) must take at least 15 GVPT semester hours at the 300-400 level; (b) GVPT majors taking the International Affairs curriculum must complete at least 15 semester hours at the 300-400 level in international affairs and comparative government courses, including GVPT 300—International Political Relations (3). Students majoring in GVPT with specialization in international affairs must take a minimum of 12 semester hours in one foreign language above the first year elementary course.

All students majoring in government and politics must fulfill the requirements of a minor. The general requirement is the completion of 15 semester hours from approved Arts and Sciences departments other than government and politics. At least six of the 15 hours must be taken at the 300-400 level from a single department.

Students majoring in government and politics with specialization in international affairs may choose to take all minor courses in geographical area studies or may take them all on a departmental basis.

Students who major in government and politics may apply for admission to the departmental Honors Program during the second semester of their sophomore year. Additional information concerning the Honors Program may be obtained at the departmental office.

Descriptions of courses in government and politics will be found in the listings of the department under the College of Business and Public Administration.

HEBREW

Visiting Professor: Iwry.
Assistant Professor: Greenberg (Director).
Instructors: Klein, Liberman.

A minor in Hebrew language and literature consists of 18 semester hours in courses numbered 200 or above. Six of these hours must be in courses on the 400 level.

Students who have never studied Hebrew, or who have little knowledge beyond reading and writing, may register for Elementary Hebrew without taking a placement exam. Students who have studied Hebrew in a Hebrew high school or day school, in Israel or at another university are required to take the placement exam. On questions of placement above the Hebrew 115 level, students should consult Professor Samuel Iwry.

HEBR 111, 112 (001, 002). ELEMENTARY HEBREW. (3, 3)
Three recitations per week and one drill hour. Elements of grammar; pronunciation and conversation; exercises in translation. (Greenberg, Klein, Liberman)

HEBR 114, 115 (006, 007). INTERMEDIATE HEBREW. (3, 3)
Three recitations per week; additional drill hour in HEBR 114. Prerequisite, HEBR 112 or equivalent. Texts designed to give some knowledge of Hebrew life, thought and culture. (Iwry, Klein)

HEBR 201, 301 (012, 013). CONVERSATION AND COMPOSITION. (3, 3)
Prerequisite, HEBR 115 or equivalent. A practical language course recommended for all students continuing with Hebrew. (Iwry)

HEBR 321, 322 (075, 076). SURVEY OF HEBREW LITERATURE. (3, 3)
Prerequisite, HEBR 115 or equivalent. (Iwry)

HEBR 421 (101). THE HEBREW BIBLE. (3)
Reading of selected portions of the *Pentateuch*. (Greenberg)

HEBR 422 (102). THE HEBREW BIBLE. (3)
Reading of selected portions of the Prophets. (Greenberg)

HEBR 431 (103). MODERN HEBREW LITERATURE. (3)
The period of the *Haskalah* (Enlightenment). (Iwry)

HEBR 432 (104). MODERN HEBREW LITERATURE. (3)
The period of the *Tehiah* (Modern Revival). (Iwry)

GREEK

(See listings under Classical Languages and Literatures.)

HISTORY

Professor and Chairman: Haber.

Professors: Bauer (Emeritus), Callcott, Cole, Foust, Gordon, Harlan, Jashemski, Kent, Koch, Merrill, Prange, Smith, Sparks.

Associate Professors: Belz, Berry, Breslow, Brush, Carter, Folsom, Giffin, Gilbert, Greenberg, Grimsted, Mayo, Schuessler, Stowasser, Warren, Yaney.

Assistant Professors: Beveridge, Bradbury, Brann, Cockburn, Farrell, Flack, Harris, Hoffman, Kaufman, Matossian, McCusker, Nicklason, Olson, Perinbam, Robertson, Shoufani, Van Ness, Williams, Wright.

Lecturers: Holum, Ridgway, Vasquez.

The Department of History seeks to broaden the student's cultural background through the study of history and to provide preparation for those interested in secondary school teaching, journalism, research and archival work, government and foreign service, and preparation for graduate study.

A faculty advisor will assist each major in planning a curriculum to meet his personal interests. Students should meet regularly with their advisors to discuss the progress of their studies.

Requirements for History Majors:

1. AS prerequisites, majors must complete HIST 221, 222, 241, and 242. Students who are exempt from HIST 221 and 222 may take any one U.S. history course in their place.
2. In addition to the prerequisites, majors must complete a minimum of 27 hours of history with grades of C or better. These 27 hours must include (a) at least nine hours of American history, which may include Latin American and Canadian history, (b) at least nine hours of non-American history, (c) three hours of HIST 389, (d) at least 18 of the 27 hours must be in 400-level courses.
3. Majors must complete not less than 9 hours of upper level courses outside of the History Department approved by a departmental advisor. Generally this will comprise work in related departments such as government and politics, economics, sociology, literature, philosophy, and fine arts. Grades in these courses must average C or better.

General Education Requirements in History

The courses with numbers up to 300 (except HIST 256 and 257) are particularly recommended to students seeking to meet the General Education requirements. These courses are especially designed for the student who wishes to enrich his knowledge and understanding of a particular society or culture in a comparatively broad chronological framework, even though he might have no professional interest in history. They may be taken during the sophomore, junior or senior years. Students with a good background in history may substitute 400-level courses where there are no stated prerequisites.

Honors in History

Students who major or minor in history may apply for admission to the History Honors Program during the second semester of their sophomore year. Those who are admitted to the program substitute discussion courses and a thesis for some of their required lecture courses, and take an oral comprehensive examination prior to graduation. Successful candidates are awarded either honors or high honors in history.

The History Department offers *pre-honors* work in American history (HIST 256, 257) and *pre-honors* sections in western civilization (HIST 241H, 242H). Students in these sections meet in a discussion group instead of attending lectures. They read widely and do extensive written work on their own. Pre-honors sections are open to any student and are recommended for students in General Honors, subject only to the instructor's approval. Students who intend to apply for admission to the History Honors Program should take as many of them as possible during their freshman and sophomore years.

PRIMARILY FRESHMAN AND SOPHOMORE COURSES

HIST 217 (017). AFRO-AMERICAN HISTORY. (3)
A survey of the Negro in American history, covering the African background, slavery, the role of the Negro in the social, political, economic, cultural and artistic life of the United States. Emphasis will be placed on the enduring themes and the black experience in American society, including contemporary problems in race relations. (Staff)

HIST 221 (021). HISTORY OF THE UNITED STATES TO 1865. (3)
A survey of the history of the United States from colonial times to the end of the Civil War. Emphasis on the establishment and development of American institutions. (American History Staff)

HIST 222 (022). HISTORY OF THE UNITED STATES SINCE 1865. (3)
A survey of economic, social, intellectual, and political developments since the Civil War. Emphasis on the rise of industry and the emergence of the United States as a world power. (American History Staff)

HIST 223 (023). SOCIAL AND CULTURAL HISTORY OF EARLY AMERICA. (3)
A study of the social and cultural history of the United States as a predominantly agricultural society. Examination of how the social milieu shapes the cultural development of the nation and its institutions.
(American History Staff)

HIST 224 (024). SOCIAL AND CULTURAL HISTORY OF MODERN AMERICA. (3)
A study of the social and cultural history of the United States as a society in transition. Examination of the social and cultural changes that accompanied industrial and scientific development. (American History Staff)

HIST 225 (029). THE UNITED STATES IN WORLD AFFAIRS. (3)
A study of the United States as an emerging world power and the American response to changing status in world affairs. Emphasis on the relationship between internal and external development of the nation.
(American History Staff)

HIST 231, 232 (031, 032). LATIN-AMERICAN HISTORY. (3, 3)
A survey of the history of Latin America from colonial origins to the present, covering political, cultural, economic, and social development, with special emphasis upon relations with the United States. First semester: Colonial Latin America. Second semester: the Republics.
(Latin-American History Staff)

HIST 241, 242 (041, 042). WESTERN CIVILIZATION. (3, 3)
This course is designed to give the student an appreciation of the civilization in which he lives in its broadest setting. The study begins with the collapse of classical civilization and comes to the present.
(European History Staff)

HIST 251, 252 (051, 052). THE HUMANITIES. (3, 3)
In surveying history from prehistoric times to the present, man's cultural development is emphasized. The course is a study of the achievements of the common cultural heritage of western civilization. It is designed as an introductory course in history which will make a more direct contribution to the other liberal arts fields. First semester, to the Renaissance. Second semester, since the Renaissance. (Jashemski)

HIST 253, 254 (053, 054). HISTORY OF ENGLAND AND GREAT BRITAIN. (3, 3)
A history of the development of British life and institutions. Open to all classes. Especially recommended for English majors and minors and pre-law students. First semester, to 1485. Second semester, since 1485.
(English History Staff)

HIST 256 (057). PRE-HONORS COLLOQUIUM IN EARLY AMERICAN HISTORY. (3)
Selected reading in early American history with emphasis on independent discussion and writing. May be taken for credit by students exempt from American history. Permission of instructor required.
(American History Staff)

HIST 257 (058). PRE-HONORS COLLOQUIUM IN MODERN AMERICAN HISTORY. (3)
Selected readings in modern American history with emphasis on independent study, discussion and writing. May be taken for credit by students exempt from American history. Permission of instructor required.
(American History Staff)

HIST 261, 262 (061, 062). FAR EASTERN CIVILIZATION. (3, 3)
This course seeks to give the student an understanding of a great civilization radically different from our own, and an appreciation of the complex problems of the Far East and of American policy there. The approach is interdisciplinary within a historical framework.
((Folsom, Mayo)

HIST 271, 272 (071, 072). ISLAMIC CIVILIZATION. (3, 3)
This course seeks to give the student an insight into a cultural heritage that dominates the lives of over four hundred million people today. The study covers Islam in Spain, North Africa, Africa below the Sahara, India, and Indonesia as well as the Middle East. The approach is humanistic within a historical framework.
(Stowasser, Shoufani)

HIST 298 (097). SPECIAL TOPICS IN HISTORY. (3)

JUNIOR AND SENIOR COURSES NOT ACCEPTABLE FOR CREDIT TOWARD GRADUATE DEGREES

HIST 389 (199). PRO-SEMINAR IN HISTORICAL WRITING. (3)
Discussions and research papers designed to acquaint the student with the methods and problems of research and presentation. The student will be encouraged to examine those phases of history which he regards as his specialties. (Staff)

HIST 395, 396 (195, 196). HONORS COLLOQUIUM. (3, 3)
Enrollment limited to students admitted by the Departmental Honors Committee. Reading in sources and secondary work centering about the development of the modern world. Discussions of reading and written work in weekly seminar meetings. (Staff)

HIST 398 (185). SPECIAL TOPICS IN HISTORY. (3)

HIST 399 (198). HONORS THESIS. (3)
Limited to students who have completed HIST 395. Normally repeated for a total of six hours credit during the senior year by candidates for honors in history. (Staff)

JUNIOR AND SENIOR COURSES ACCEPTABLE FOR CREDIT TOWARD GRADUATE DEGREES

HIST 401 (137). THE SCIENTIFIC REVOLUTION: FROM COPERNICUS TO NEWTON. (3)
Major developments in the history of physics and astronomy during the 16th and 17th centuries and critical evaluations of the Copernican Revolution, the "mechanical philosophy" of the 17th-century scientists, and the Newtonian synthesis and its impact on 18th-century thought.
(Brush)

HIST 402 (138). THE DEVELOPMENT OF MODERN PHYSICAL SCIENCE: FROM LAVOISIER TO EINSTEIN. (3)
Prerequisites, MATH 110 and PHYS 112 or 117. History of chemistry, physics and geology during the period from about 1775 to about 1925. (Brush)

HIST 403 (144). HISTORY OF TECHNOLOGY. (3)
A survey course designed for junior, senior and graduate students with a solid base in either engineering or history; it will cover the time span from Greek antiquity to the First World War. Technology will be studied as a cultural force controlled by laws of its own and operating within a distinctive conceptual framework. The course will concentrate on the changing character of technology in history and on the interactions between technology and other cultural forces such as science, philosophy, art, material culture, and the economy. (Staff)

HIST 404 (140). HISTORY OF MODERN BIOLOGY. (3)
The internal development of biology from about 1750 to about 1940 will be covered, including evolution, cell theory, genetics, enzymes, and biochemistry, and the origins of anthropology and experimental psychology. The social circumstances under which biology arose and prospered, the philosophical aspects of some debates, the technical achievements enabling new research, and the influences of other sciences on biology will also be discussed.

HISTORY OF THE UNITED STATES

HIUS 401 (HIST 101) AMERICAN COLONIAL HISTORY. (3)
The settlement and development of colonial America to the middle of the eighteenth century.
(McCusker, Bradbury)

HIUS 402 (HIST 102). THE AMERICAN REVOLUTION. (3)
The background and course of the American Revolution through the formation of the Constitution.
(Bradbury, Hoffman)

HIUS 403 (HIST 103). THE FORMATIVE PERIOD IN AMERICA. 1789-1824. (3)
The evolution of the Federal government, the origins of political parties, problems of foreign relations in an era of international conflict, beginnings of the industrial revolution in America, and the birth of sectionalism.
(Bradbury, Hoffman)

HIUS 404, 405 (HIST 107, 108). ECONOMIC HISTORY OF THE UNITED STATES. (3, 3)
The development of the American economy and its institutions. First semester, to 1865; second semester, since 1865. (McCusker)

HIUS 406, 407 (HIST 109, 110). SOCIAL HISTORY OF THE UNITED STATES. (3, 3)
Formation of regional societies; immigration and nativism; the Negro; urban movement; social responses to technological change. First semester, to 1865; second semester, since 1865. (Beveridge)

HIUS 410 (HIST 114). THE MIDDLE PERIOD OF AMERICAN HISTORY, 1824-1860. (3)
An examination of the political history of the United States from Jackson to Lincoln with particular emphasis on the factors producing Jacksonian democracy, Manifest Destiny, the Whig Party, the anti-slavery movement, the Republican Party, and secession. (Grimsted)

HIUS 411 (HIST 116). THE CIVIL WAR. (3)
Military aspects; problems of the Confederacy; political, social and economic effects of the war upon American society. (Smith)

HIUS 412 (HIST 124). RECONSTRUCTION AND THE NEW NATION, 1865-1896. (3)
Prerequisite, six credits of American history, or permission of instructor. Problems of reconstruction in both South and North. Emergence of big business and industrial combinations. Problems of the farmer and laborer.
(Smith)

HIUS 413 (HIST 118). THE PROGRESSIVE PERIOD: THE UNITED STATES, 1896-1919. (3)
(Merrill, Harlan, Olson)

HIUS 414 (HIST 119). BETWEEN THE WARS: THE UNITED STATES, 1919-1945. (3) (Merrill, Harlan, Olson)

HIUS 415 (HIST 120). THE UNITED STATES SINCE WORLD WAR II. (3)
Problems and issues of American society, foreign and domestic, of the past generation. (Olson)

HIUS 416 (HIST 117). BLACKS IN AMERICAN LIFE. (3)
The role of the Black in America since slavery, with emphasis on twentieth-century developments: the migration from farm to city; the growth of the civil rights movement; the race question as a national problem.
(Harlan, Carter, Berry)

HIUS 417 (HIST 121). HISTORY OF THE AMERICAN FRONTIER. (3)
The Trans-Allegheny West. The westward movement into the Mississippi Valley. (Ferrell)

HIUS 420, 421 (HIST 122, 123). HISTORY OF THE SOUTH. (3, 3)
Prerequisite, HIST 221, 222, or equivalent. The golden age of the Chesapeake, the institution of slavery, the antebellum plantation society, the experience of defeat, the impact of industrialization, and the modern racial adjustment. (Carter, Callcott)

HIUS 422, 423 (HIST 127, 128). DIPLOMATIC HISTORY OF THE UNITED STATES. (3, 3)
A historical study of the diplomatic negotiations and foreign relations of the United States. First semester, from the Revolution to 1898. Second semester, from 1898 to the present. Students who have taken HIST 225 are admitted only by permission of instructor. (Cole)

HIUS 424, 425 (HIST 133, 134). THE HISTORY OF IDEAS IN AMERICA. (3, 3)
A history of basic beliefs about religion, man, nature, and society. Consent of the instructor is required for HIUS 425. (Koch, Flack, Gilbert, Grimsted)

HIUS 426, 427 (HIST 135, 136). CONSTITUTIONAL HISTORY OF THE UNITED STATES. (3, 3)
A study of the historical forces resulting in the formation of the Constitution, and development of American constitutionalism in theory and practice thereafter.
(Belz, Berry)

HIUS 430 (HIST 141). HISTORY OF MARYLAND. (3)
Political, social and economic history of Maryland from seventeenth century to the present. (Van Ness)

HISTORY OF FOREIGN NATIONS

HIFN 401, 402 (HIST 142, 143). HISTORY OF SPAIN. (3, 3)
Political, social and economic development of Spain; the Spanish empire; Spain's role in Europe. Some attention will be paid to Portuguese history. First semester: 1469-1700. Second semester: 1700-present. (Vasquez)

HIFN 403 (HIST 146). DIPLOMATIC HISTORY OF LATIN AMERICA. (3)
A survey of the political, economic and cultural relations of the Latin American nations with emphasis on their relations with the United States and the development of the inter-American system. (Wright)

HIFN 404 (HIST 148). HISTORY OF CANADA. (3)
Prerequisites, HIST 241, 242 or HIST 253, 254. A history of Canada, with special emphasis on the nineteenth century and upon Canadian relations with Great Britain and the United States. (Gordon)

HIFN 405 (HIST 149). HISTORY OF BRAZIL. (3)
The history of Brazil with emphasis on the national period. (Giffin)

HIFN 406, 407 (HIST 111, 112). HISTORY OF MEXICO AND THE CARIBBEAN. (3, 3)
The history of Mexico, Central America and the Antilles, beginning with the pre-Spanish Indian cultures and continuing through the Spanish colonial period and the national period to the present day. The division point between the two courses is the year 1810, the beginning of the Mexican wars for independence. (Warren)

HIFN 410 (HIST 153). HISTORY OF ROME. (3)
A study of Roman civilization from the earliest beginnings through the Republic and down to the last centuries of the Empire. (Jashemski, Holum)

HIFN 411, 412 (HIST 155, 156) HISTORY OF MEDIEVAL EUROPE. (3, 3)
A study of medieval government, society and thought from the collapse of classical civilization to the Renaissance. (Robertson)

HIFN 413 (HIST 158). THE OLD REGIME AND THE FRENCH REVOLUTION, 1748-1815. (3)
Europe in the era of the French Revolution. (Williams)

HIFN 414, 415 (HIST 159, 160). HISTORY OF EUROPEAN IDEAS. (3, 3)
Prerequisites, HIST 241, 242 or HIST 253, 254, or the equivalent. Beginning with a review of the basic Western intellectual traditions as a heritage from the ancient world, the courses will present selected important currents of thought from the scientific revolution of the sixteenth and seventeenth centuries down to the twentieth century. First semester, through the eighteenth century. Second semester, nineteenth and twentieth centuries.
(Haber, Brann, Williams)

HIFN 416, 417 (HIST 161, 162). THE RENAISSANCE AND REFORMATION. (3, 3)
Prerequisite, HIST 241, 242 or 253, or consent of instructor. City-states and the rise of nation-states, the culture and thought of the Renaissance, the Reformation and their impact into the seventeenth century. (Schuessler, Brann)

HIFN 420, 421 (HIST 163, 164). HISTORY OF THE BRITISH EMPIRE. (3, 3)
Prerequisite, HIST 241, 242 or HIST 253, 254 First semester, the development of England's mercantilist empire and its fall in the war for American Independence (1783). Second semester, the rise of the Second British Empire and the solution of the problem of responsible self-government (1783-1867), the evolution of the British Empire into a Commonwealth of Nations, and the development and problems of the dependent Empire. (Gordon)

HIFN 422, 423 (HIST 165, 166). CONSTITUTIONAL HISTORY OF GREAT BRITAIN. (3, 3)
Constitutional development in England, with emphasis on the history of the royal prerogative, the growth of the common law, the development of Parliament, and the emergence of systematized government. First semester, to 1485; second semester, since 1485. (Cockburn)

HIFN 424, 425 (HIST 167, 168). HISTORY OF RUSSIA. (3, 3)
A history of Russia from earliest times to 1917. (Yaney)

HIFN 426, 427 (HIST 169, 170). EUROPE IN THE NINETEENTH CENTURY, 1815-1919. (3, 3)
Prerequisites, HIST 241, 242 or HIST 253, 254. A study of the political, economic, social, and cultural development of Europe from the Congress of Vienna to the First World War. (Kent)

HIFN 430, 431 (HIST 171, 172). EUROPE IN THE WORLD SETTING OF THE TWENTIETH CENTURY. (3, 3)
Prerequisites, HIST 241, 242 or 253, 254. A study of political, economic and cultural developments in twentieth-century Europe with special emphasis on the factors involved in the two World Wars and their global impacts and significance. (Prange, Harris)

HIFN 432 (HIST 173). THE SOVIET UNION. (3)
A history of the Bolshevik Revolution and the founding of the Soviet Union; the economic policy and foreign policy of the U.S.S.R. to the present. (Foust)

HIFN 433 (HIST 175). MODERN FRANCE. (3)
A survey of French history from 1815 to the present. The emphasis is upon such topics as the population problem, the economic and social structure of French society, and the changing political and cultural values of this society in response to recurrent crises through the nineteenth and twentieth centuries. (Greenberg)

HIFN 434 (HIST 176). TUDOR ENGLAND. (3)
An examination of the political, religious and social forces in English life, 1485-1603, with special emphasis on Tudor government, the English Reformation and the Elizabethan era. (Breslow)

HIFN 435 (HIST 177). STUART ENGLAND. (3)
An examination of the political, religious and social forces in English life, 1603-1714, with special emphasis on Puritanism and the English revolutions. (Breslow)

HIFN 436 (HIST 178). BRITAIN IN THE EIGHTEENTH CENTURY. (3)
Developments in Great Britain from the Revolution of 1688 to the end of the Napoleonic wars. (Cockburn)

HIFN 437 (HIST 179). MODERN BRITAIN. (3)
A survey of British history from the age of the French Revolution to World War I with emphasis upon such subjects as Britain's role in the world, the democratization of the state, the problems arising from industrialism and urbanism, and Irish and imperial problems. (Gordon)

HIFN 442, 443 (HIST 187, 188). HISTORY OF CHINA. (3, 3)
A history of China from earliest times to the present. The emphasis is on the development of Chinese institutions that have molded the life of the nation and its people. (Folsom)

HIFN 444 (HIST 157). THE AGE OF ABSOLUTISM, 1648-1748. (3)
Europe in the Age of Louis XIV and the Enlightened Despots. (Williams)

HIFN 445, 446 (HIST 189, 190). HISTORY OF JAPAN. (3, 3)
First semester: Japanese civilization from the age of Shinto mythology, introduction of continental learning, and rule of military overlords. Second semester: renewed contact with the western world and Japan's emergence as a modern state. (Mayo)

HIFN 447 (HIST 197). STUDIES IN MIDDLE EASTERN CULTURE. (3)
Systematic treatment of aspects of literature and culture of the Middle East. May be repeated. (Stowasser)

HIFN 450, 451 (HIST 180, 181). THE MIDDLE EAST. (3, 3)
A survey of the political, cultural and institutional history of that area. The first part covers the period up to the middle of the tenth century. The second part covers to the beginning of the nineteenth century. (Shoufani)

HIFN 452 (HIST 182). THE CONTEMPORARY MIDDLE EAST. (3)
This course covers the history of the Middle East from the time of Napoleon to the Second World War. (Shoufani)

HIFN 454 (HIST 194). HISTORY OF THE JEWS AND THE STATE OF ISRAEL. (3)
A survey of Jewish history from the second century Diaspora to the present with special attention to an analysis of Zionism, the creation of a Jewish home in Palestine, the establishment of the state of Israel, and modern developments. (Staff)

HIFN 455 (HIST 150). HISTORY OF ARGENTINA AND THE ANDEAN REPUBLICS. (3)
The history of the nationalist period of selected South American countries. (Wright)

HIFN 456 (HIST 151). HISTORY OF THE ANCIENT ORIENT AND GREECE. (3)
A survey of the ancient civilizations of Egypt, the Near East and Greece, with particular attention to their institutions, life, and culture. (Jashemski)

HIFN 460, 461 (HIST 104, 105). SOCIAL AND CULTURAL HISTORY OF EUROPE. (3, 3)
An exploration of social structure, life styles, rituals, symbols, and myths of the peoples of Europe. First semester: from earliest times to 1800. Second semester: the modernization of European society. (Matossian)

HIFN 473 (HIST 183). A SURVEY OF AFRICAN HISTORY. (3)
A brief survey of the history of sub-Saharan Africa from prehistoric times to the end of the colonial era. Special focus on neolithic civilizations, major migrations and political and commercial developments in pre-colonial and colonial Africa. (Perinbam)

HIFN 474 (HIST 184). A HISTORY OF WEST AFRICA. (3)
HIFN 473 is recommended though not required. A regional study of the western Sudan, forest and coastal regions from prehistoric times to the nineteenth century. A discussion of neolithic and iron age civilizations, trans-Saharan and other trade, introduction of Islam, medieval Sudanese empires, forest kingdoms, nineteenth-century empires and kingdoms, and the impact of European penetration. (Perinbam)

FOR GRADUATE STUDENTS

See the *Graduate School* catalog for descriptions.

HIST 600 (200). HISTORIOGRAPHY: TECHNIQUES OF HISTORICAL RESEARCH AND WRITING. (3)

HIST 685 (290). THE TEACHING OF HISTORY IN INSTITUTIONS OF HIGHER LEARNING. (1)

HIST 708 (239). READINGS IN THE HISTORY OF MODERN SCIENCE. (3)

HIST 798 (297). SPECIAL TOPICS IN HISTORY. (3)

HIST 799 (399). THESIS RESEARCH. (1-6)

HIST 808 (240). SEMINAR IN THE HISTORY OF MODERN SCIENCE. (3)

HIST 899 (499). DISSERTATION RESEARCH. (Arranged)

HIUS 708 (HIST 201). READINGS IN COLONIAL AMERICAN HISTORY. (3)

HIUS 709 (HIST 203). READINGS IN THE AMERICAN REVOLUTION AND THE FORMATIVE PERIOD. (3)

HIUS 718 (HIST 205). READINGS IN AMERICAN SOCIAL AND ECONOMIC HISTORY. (3)

HIUS 719 (HIST 213). READINGS IN SOUTHERN HISTORY. (3)

HIUS 728 (HIST 215). READINGS IN THE MIDDLE PERIOD AND CIVIL WAR. (3)

HIUS 729 (HIST 217). READINGS IN RECONSTRUCTION AND THE NEW NATION. (3)

HIUS 738 (HIST 223). READINGS IN RECENT AMERICAN HISTORY. (3)

HIUS 739 (HIST 227). READINGS IN THE HISTORY OF AMERICAN FOREIGN POLICY. (3)

HIUS 748 (HIST 233). READINGS IN AMERICAN INTELLECTUAL HISTORY. (3)

HIUS 749 (HIST 235). READINGS IN AMERICAN CONSTITUTIONAL HISTORY. (3)

HIUS 808 (HIST 202). SEMINAR IN COLONIAL AMERICAN HISTORY. (3)

HIUS 809 (HIST 204). SEMINAR IN THE AMERICAN REVOLUTION AND THE FORMATIVE PERIOD. (3)

HIUS 818 (HIST 206). SEMINAR IN AMERICAN SOCIAL AND ECONOMIC HISTORY. (3)

HIUS 819 (HIST 214). SEMINAR IN SOUTHERN HISTORY. (3)

HIUS 828 (HIST 216). SEMINAR IN THE MIDDLE PERIOD AND CIVIL WAR. (3)

HIUS 829 (HIST 218). SEMINAR IN RECONSTRUCTION AND THE NEW NATION. (3)

HIUS 838 (HIST 224). SEMINAR IN RECENT AMERICAN HISTORY. (3)

HIUS 839 (HIST 228). SEMINAR IN THE HISTORY OF AMERICAN FOREIGN POLICY. (3)

HIUS 848 (HIST 234). SEMINAR IN AMERICAN INTELLECTUAL HISTORY. (3)

HIUS 849 (HIST 236). SEMINAR IN AMERICAN CONSTITUTIONAL HISTORY. (3)

HIUS 859 (HIST 242). SEMINAR IN THE HISTORY OF MARYLAND. (3)

HIFN 708 (HIST 245). READINGS IN LATIN AMERICAN HISTORY. (3)

HIFN 728 (HIST 255). READINGS IN MEDIEVAL HISTORY. (3)

HIFN 729 (HIST 257). READINGS IN 17TH-CENTURY EUROPEAN HISTORY. (3)

HIFN 738 (HIST 259). READINGS IN MODERN EUROPEAN INTELLECTUAL HISTORY. (3)

HIFN 739 (HIST 261). READINGS IN THE HISTORY OF THE RENAISSANCE AND REFORMATION. (3)

HIFN 748 (HIST 263). READINGS IN THE HISTORY OF GREAT BRITAIN AND THE BRITISH EMPIRE-COMMONWEALTH. (3)

HIFN 759 (HIST 269). READINGS IN NINETEENTH CENTURY EUROPE. (3)

HIFN 778 (HIST 274). READINGS IN MODERN FRENCH HISTORY. (3)

HIFN 779 (HIST 281). READINGS IN MIDDLE EASTERN HISTORY. (3)

HIFN 788 (HIST 285). READINGS IN JAPANESE HISTORY. (3)

HIFN 789 (HIST 287). READINGS IN CHINESE HISTORY. (3)

HIFN 808 (HIST 246). SEMINAR IN LATIN AMERICAN HISTORY. (3)

HIFN 818 (HIST 251). SEMINAR IN GREEK HISTORY. (3)

HIFN 819 (HIST 253). SEMINAR IN ROMAN HISTORY. (3)

HIFN 828 (HIST 256). SEMINAR IN MEDIEVAL HISTORY. (3)

HIFN 829 (HIST 258). SEMINAR IN 17TH-CENTURY EUROPEAN HISTORY. (3)

HIFN 838 (HIST 260). SEMINAR IN MODERN EUROPEAN INTELLECTUAL HISTORY. (3)

HIFN 839 (HIST 262). SEMINAR IN THE HISTORY OF THE RENAISSANCE AND REFORMATION. (3)

HIFN 848 (HIST 264). SEMINAR IN THE HISTORY OF GREAT BRITAIN AND THE BRITISH EMPIRE-COMMONWEALTH. (3)

HIFN 849 (HIST 266). SEMINAR IN TUDOR AND STUART ENGLAND. (3)

HIFN 858 (HIST 268). SEMINAR IN RUSSIAN HISTORY. (3)

HIFN 859 (HIST 270). SEMINAR IN NINETEENTH-CENTURY EUROPE. (3)

HIFN 868 (HIST 271). SEMINAR IN THE HISTORY OF WORLD WAR I. (3)

HIFN 869 (HIST 272). SEMINAR IN THE HISTORY OF WORLD WAR II. (3)

HIFN 878 (HIST 275). SEMINAR IN MODERN FRENCH HISTORY. (3)

HIFN 879 (HIST 282). SEMINAR IN MIDDLE EASTERN HISTORY. (3)

HIFN 888 (HIST 286). SEMINAR IN JAPANESE HISTORY. (3)

HIFN 889 (HIST 288). SEMINAR IN CHINESE HISTORY. (3)

GENERAL HONORS PROGRAM

Director: Portz.

The General Honors Program is administered by the Director of the Arts and Sciences Honors Programs and by the College Honors Committee which also acts as an advisory and regulatory body for all honors programs within the College. Admission to the General Honors Program shall ordinarily be at the beginning of the first or second semester of the student's freshman year. Students are selected on the basis of SAT scores, grades, rank in graduating class, recommendations from high school teachers and counselors, and other factors dealing with academic and non-academic achievement in high school. Students transferring from other institutions are accepted into general honors upon presentation of a distinguished record.

General honors students are assigned to honors sections of General Education courses, and are given the opportunity of participating in special general honors seminars. Continuance in the program is based upon maintaining a B average or

better. Successful General Honors students are graduated with a citation in general honors and notation of this accomplishment is made upon their transcripts. For further information and admission to general honors, see the Director of Honors, Francis Scott Key Hall.

SPECIAL GENERAL HONORS COURSES

HONR 100 (001). HONORS ORIENTATION COLLOQUIUM. (3)
A colloquium on composition and on current topics in the humanities, the natural sciences and the social sciences. The topics will vary with the interest of the instructors. Writing and analysis of themes on, and in-class discussions of, assigned reading will be stressed. Ordinarily taken by all general honors freshmen. Open to other students with the consent of the director of honors. (Staff)

HONR 339 (130). SEMINARS IN THE SOCIAL SCIENCES. (1-4)
A series of seminars in the social sciences. Often interdisciplinary in character and often team-taught. The subjects of the seminars and the faculty may vary from semester to semester. Seminars may be repeated for credit, with the permission of the director of honors, if the content of the course alters appreciably. Open to general and departmental honors students and to other students with the consent of the instructor and the director of honors.

HONR 349 (140). SEMINARS IN THE NATURAL SCIENCES. (1-4)
A series of seminars in the natural sciences. Often interdisciplinary in character and often team-taught. The subjects of the seminars and the faculty may vary from semester to semester. Seminars may be repeated for credit, with the permission of the director of honors, if the content of the course alters appreciably. Open to general and departmental honors students and to other students with the consent of the instructor and the director of honors. (Staff)

HONR 359 (150). SEMINARS IN THE HUMANITIES. (1-3)
A series of seminars in the humanities. Often interdisciplinary in character and often team-taught. The subjects of the seminars and the faculty may vary from semester to semester. Seminars may be repeated for credit, with the permission of the director of honors, if the content of the course alters appreciably. Open to general and departmental honors students and to other students with the consent of the instructor and the director of honors. (Staff)

HONR 360 (160). HONORS THESIS RESEARCH. (3)
A thesis preparation course for general honors seniors under the direction of individual faculty members. HONR 360 or HONR 379, but not both, may be used once to fulfill the general honors seminar requirement. Graded pass-fail. May not be repeated. Open only to general honors students. (Staff)

HONR 379 (170). HONORS INDEPENDENT STUDY. (3)
Honors independent study involves reading or research, directed by individual faculty, especially in areas outside of the student's major. HONR 379 or HONR 360 but not both, may be used once to fulfill the general honors seminar requirement. Graded pass-fail. May be repeated only with consent of the director of honors. Open only to general honors students. (Staff)

ITALIAN

(See listings under French and Italian Language and Literature.)

LATIN

(See listings under Classical Languages and Literature.)

LINGUISTICS

Assistant Professor and Director: Dingwall.
Assistant Professor: Fidelholtz.

The program in linguistics is designed to provide students with a comprehensive and consistent view of the accomplishments, methodology and problems of modern linguistic science which has as its aim the explication of the facts of specific natural languages as well as of natural language in general. While any educated man will benefit from an understanding of the structure and development of language, those who expect to become scholars and teachers of anthropology, English, foreign languages, philosophy, psychology, or speech will find a background in linguistics invaluable. Although there is not an undergraduate major in linguistics at this time, courses in linguistics may be used to fulfill the supporting course requirements in some programs leading to the B.A. or B.S. degree.

LING 100 (101). INTRODUCTION TO LINGUISTICS. (3)
Introduction to the basic concepts of modern descriptive linguistics. Phonology, morphology, syntax. Examinations of the methods of comparative linguistics, internal reconstruction, dialect geography. (Listed also as ANTH 371 and as ENGL 280). (Fidelholtz)

LING 101 (071). LANGUAGE AND CULTURE. (3)
Prerequisite, sophomore standing. A nontechnical introduction to linguistics, with special consideration of the relations between language and other aspects of culture. (Listed also as ANTH 271). (Fidelholtz)

LING 401 (102). PHONETICS AND PHONEMICS. (3)
Training in the identification, description and symbolization of various sounds found in language. Study of scientific techniques for classifying sounds into units which are perceptually relevant for a given language. (Dingwall)

LING 402 (103). MORPHOLOGY AND SYNTAX. (3)
A detailed study of language structure. No student may receive credit for both LING 402 and ENGL 484. (Dingwall)

LING 403 (106). HISTORICAL LINGUISTICS. (3)
Prerequisite, LING 401 and 402, or equivalent. A study of change in the phonological, grammatical and semantic structures of natural languages; language typology; reconstruction and various allied topics will be treated. (Staff)

LING 609 (201). SEMINAR IN LINGUISTICS. (3)

Other programs also offer courses in linguistics that may be of interest to the student. Some of the most relevant are listed below:

ANTH 102. INTRODUCTION TO ANTHROPOLOGY: CULTURAL ANTHROPOLOGY AND LINGUISTICS.

CMSC 723. COMPUTATIONAL LINGUISTICS.

CMSC 725. MATHEMATICAL LINGUISTICS.

ENGL 484 ADVANCED ENGLISH GRAMMAR.

PHIL 360. PHILOSOPHY OF LANGUAGE.

PSYC 671. VERBAL BEHAVIOR.

SPHR 604. EXPERIMENTAL PHONETICS.

MATHEMATICS

Professor and Chairman: Goldhaber.
Professors: Auslander, Brace, Chu, Cohen, Douglis, Edmundson,* Ehrlich, Goldberg, Good, Gray, Greenberg, Horvath, Huet, Hummel, Jackson, Karp, Kleppner, Kubota, Kuroda, G. Lehner, J. Lehner, Maltese, Mikulski, Pearl, Reinhart, Stellmacher, Syski, Vesentini, Walsh, Zedek.
Visiting Professors: Choquet, Dieudonne, Kahane, Katznelson, Koethe, Leopoldt, W. Schneider.
Associate Professors: Adams, Benedetto, Bernstein, Cook, Correl, Dancis, Daniel, Goldstein, Green, Gulick, Henkelman,** Kirwan, Lay, Lipsman, Lopez-Escobar, Markley, Neri, Osborn, Owings, Sather, Schafer, Strauss, Warner, Wolfe.
Assistant Professors: Alexander, Anderson, Berg, Connell, Cooper, Currier, Davidson,** Ellis, Fey,** Gowen, Helzer, Johnson, Niebur, Powell, Rastogi, D. Schneider, Shepherd, Sweet, Unsain, Wagner, Yang.
Instructors: Brown, Kilbourn, Lepson, McClay, Sorensen, Steely.
Faculty Research Assistants: Hill, Locksley.

The program in mathematics leading to the degree of Bachelor of Science in Mathematics offers students training in mathematics in preparation for graduate work, teaching and positions in government or industry.

A student intending to major in mathematics must complete the introductory sequence MATH 130, 131, 230, 231 or the corresponding honors sequence MATH 140, 141, 240, 241 and should have an average grade of at least B in these courses. In addition, the requirements for a mathematics major include eight suitably distributed upper division courses (24 credit hours) in mathematics with a grade of at least C. The requirements are detailed in a departmental brochure which is available through the undergraduate office. Appropriate courses taken at other universities or through University College may be used to fulfill these requirements, but at least four of the eight required upper division mathematics courses must be taken in the College of Arts and Sciences.

In addition to the above, a mathematics major must include at least 22 credit hours of supporting course work; ten specified credit hours of science and twelve specified credit hours of other supporting course work (which need not be in science) are required. These requirements can be met in various ways; for details, the departmental brochure for majors should be consulted.

Since most of the non-English mathematical literature is written in French, German or Russian, students intending to continue studying mathematics in graduate school should obtain a reading knowledge of at least one of these languages.

*Joint Appointment: Computer Science Center
**Joint Appointment: Department of Secondary Education.

HONORS IN MATHEMATICS

The Mathematics Honors Program is designed for students showing exceptional ability and interest in mathematics. Its aim is to give a student the best possible mathematical education. Participants are selected by the Departmental Honors Committee during the first semester of their junior year. To graduate with honors in mathematics they must take four credits of MATH 398 and pass a final written and oral comprehensive examination. The rest of the program is flexible. Independent work is encouraged and can be done in place of formal course work. A student need not major in mathematics to participate in the honors program.

The department also offers a special departmental honors calculus sequence (MATH 140, 141, 240, 241) for promising freshmen with a strong mathematical background (usually including calculus). Enrollment in the sequence is normally by invitation but any interested student may apply to the Departmental Honors Committee for admission.

Participants in the College of Arts and Sciences Honors Program may enroll in special honors sections of the regular calculus sequence (MATH 130H, 131H, 230H, 231H). They may enroll in the honors calculus sequence if invited by the Departmental Honors Committee. However the departmental honors calculus sequence and the College Honors Program are distinct, and enrollment in one does not imply acceptance in the other.

Neither honors calculus sequence is prerequisite for participating in the Mathematics Honors Program, and students in these sequences need not be mathematics majors.

PI MU EPSILON

The local chapter of Pi Mu Epsilon, national honorary mathematics fraternity, meets frequently to discuss mathematical or educational topics of interest to undergraduates. The programs are open to the public.

PLACEMENT IN MATHEMATICS COURSES

The department has a large offering to accommodate a great variety of backgrounds, interests and abilities. The department permits a student to take any course for which he has the appropriate background regardless of formal course work. For example, a student with a high school calculus course may be permitted to begin in the middle of the calculus sequence even if he does not have advanced standing. Students are urged to consult with advisors from the Mathematics Department to assist with proper placements.

MATH 001 (001). REVIEW OF HIGH SCHOOL ALGEBRA. (0) Recommended for students who fail the qualifying examination for MATH 105, MATH 110, MATH 115. Special fee of $45.

MATH 105 (003). FUNDAMENTALS OF MATHEMATICS. (4) Prerequisite, satisfactory performance on the SAT math-

ematics test, or MATH 001. This course is designed to provide an introduction to mathematical thinking, stressing ideas rather than techniques. Where possible, connections are drawn with other disciplines, such as philosophy, logic and art.

MATH 110, 111 (010, 011). INTRODUCTION TO MATHEMATICS. (3, 3)
Prerequisite, 2½ years of college preparatory mathematics and satisfactory performance on the SAT mathematics test, or MATH 001. Open to students not majoring in mathematics or the physical or engineering sciences. Logic, sets, counting, probability; sequences, sums; elementary algebraic and transcendental functions and their geometric representation; systems of linear equations, vectors, matrices.

MATH 115 (018). INTRODUCTORY ANALYSIS. (3)
(2 lectures, 2 drill periods per week.) Prerequisite, 2½ years of college preparatory mathematics and an appropriate score on the SAT mathematics test, or MATH 001. An introductory course for students not qualified to start MATH 140. Real numbers, functions, coordinate systems. Trigonometric functions. Plane analytic geometry.

MATH 140 (019). ANALYSIS I. (4)
(3 lectures, 2 drill periods per week.) Prerequisite, 3½ years of college preparatory mathematics or MATH 115. Sets and inequalities, Cartesian coordinates in the plane, the straight line, the circle, translation of coordinate axes, functions and their graphs, limits, continuity, the derivative and application of the derivative, antiderivatives, definite integral.

MATH 141 (020). ANALYSIS II. (4)
(3 lectures, 2 drill periods per week.) Prerequisite, MATH 140 or equivalent. Applications of integration, techniques of integration, polar coordinates, basic properties of the elementary functions, improper integrals, indeterminate forms, sequences, and infinite series.

MATH 150 (050). CALCULUS I. (Honors) (4)
Prerequisite, approval of department. A rigorous treatment, with applications, of differential and integral calculus in one variable.

MATH 151 (051). CALCULUS II. (Honors) (4)
Prerequisite, approval of department. A rigorous treatment, with applications, of differential and integral calculus in one variable.

MATH 210 (030). ELEMENTS OF MATHEMATICS. (4)
Prerequisite, one year of college preparatory algebra. Required for majors in elementary education, and open only to students in this field. Topics from algebra and number theory, designed to provide insight into arithmetic: inductive proof, the natural number system based on the Peano axioms; mathematical systems, groups, fields; the system of integers; the system of rational numbers; congruence, divisibility; systems of numeration.

MATH 211 (031). ELEMENTS OF GEOMETRY. (4)
Prerequisite, MATH 210 or equivalent. Structure of mathematics systems, algebra of sets, geometrical structures, logic, measurement, congruence similarity graphs in the plane geometry on the sphere.

MATH 220, 221 (014, 015). ELEMENTARY CALCULUS. (3, 3)
Prerequisite, MATH 110, MATH 115 or equivalent. Open to students not majoring in mathematics or the physical or engineering sciences. Basic ideas of differential and integral calculus; elementary techniques and applications.

MATH 240 (021L). LINEAR ALGEBRA. (4)
(3 lectures, 2 drill periods per week.) Prerequisite, MATH 141 or equivalent. Basic concepts of linear algebra: vector spaces, applications to line and plane geometry, linear equations and matrices, similar matrices, linear transformations, eigenvalues, determinants, and quadratic forms.

MATH 241 (022). ANALYSIS III. (4)
(3 lectures, 2 drill periods per week.) Prerequisite, MATH 240 or equivalent. Calculus of functions of vectors: partial derivatives, multiple integration, surface integrals, classical theorems of Green, Gauss, and Stokes.

MATH 246 (066). DIFFERENTIAL EQUATIONS FOR SCIENTISTS AND ENGINEERS. (3)
Prerequisite, MATH 141 or equivalent. The field of direction and graphic solutions of first order differential equations. The simplest methods of numerical solution. Systems of differential equations. Introduction to Fourier series, and applications.

MATH 250 (052). CALCULUS III. (Honors) (4)
Prerequisite, approval of department. Elements of linear algebra, Euclidean and other metric spaces; Multi-variable calculus; Implicit function theorem; theorems of Green, Gauss and Stokes. Riemann Stieltjes integral and, as time permits, ordinary differential equations, Fourier series, orthogonal functions.

MATH 251 (053) CALCULUS IV. (Honors) (4)
Prerequisite, approval of department. Elements of linear algebra, Euclidean and other metric spaces; Multi-variable calculus; implicit function theorem; theorems of Green, Gauss and Stokes. Riemann Stieltjies integral and, as time permits, ordinary differential equations, Fourier series, orthogonal functions.

STAT 250 (050). INTRODUCTION TO RANDOM VARIABLES. (3)
Prerequisite, MATH 221 or MATH 141. Introductory mathematical concepts. Probabilistic concepts. Basic properties of probability. Discrete random variables and their distributions. Continuous variables (intuitive analytic approach). Joint distributions and transformations. Moments and moment generating functions. Law of large numbers and de Moivre's theorem.

MATH 398 (190). HONORS SEMINAR. (2)
Prerequisite, permission of the Departmental Honors Committee. Reports by students on mathematical literature; solution of various problems.

Courses 400-499
Algebra and Number Theory: 400, 401, 403, 405, 406, 407
Analysis: 410, 411, 413, 414, 415, 416, 417
Geometry and Topology: 430, 431, 432, 433, 434, 436, 437
Foundations of Mathematics: 444, 446, 447, 450
Applied Mathematics: 401, 415, 462, 463, 464, 470, 471
Courses for Teachers of Mathematics and Science: 478, 481, 482, 483, 484, 488
Seminars, Selected Topics, Research: 398, 498
Statistics and Probability: (Stat) 400, 401, 410, 411, 420, 421, 450, 464, 470

MATH 400 (100). VECTORS AND MATRICES. (3)
Prerequisite, MATH 141 or MATH 221. Algebra of vector spaces and matrices. Recommended for students interested in the applications of mathematics. (Not open to students who have had MATH 405 or MATH 240.)

MATH 401 (101). APPLIED LINEAR ALGEBRA. (3)
Prerequisite, MATH 400, or MATH 240, or consent of the instructor. Various applications of linear algebra: theory of finite games, linear programming, matrix methods as applied to finite Markov chains, random walk, incidence metrices, graphs and directed graphs, networks, transportation problems.

MATH 403 (103). INTRODUCTION TO ABSTRACT ALGEBRA. (3)
Prerequisite, MATH 241 or equivalent. Integers; groups, rings, integral domains, fields.

MATH 405 (104). INTRODUCTION TO LINEAR ALGEBRA. (3)
Prerequisite, MATH 403 or consent of instructor. An abstract treatment of finite dimensional vector spaces. Linear transformations and their invariants.

MATH 406 (106). INTRODUCTION TO NUMBER THEORY. (3)
Prerequisite, MATH 241. Rational integers, divisibility, prime numbers, modules and linear forms, unique factorization theorem. Euler's function, Mobius' function, cyclotomic polynomial, congruences and quadratic residues, Legendre's and Jacobi's symbol, reciprocity law

of quadratic residues, introductory explanation of the method of algebraic number theory.

MATH 407 (107). THEORY OF QUADRATIC NUMBER FIELDS. (3)
Prerequisite, MATH 406 and MATH 403. Quadratic number fields, integers, ideals, units, ideal class groups, unimodular transformations and algorithms of the determination of ideal class groups and fundamental units, class number formula, Gauss' theory of genera and Kronecker's symbol.

MATH 410, 411 (110, 119). ADVANCED CALCULUS. (3, 3)
Prerequisite, MATH 241. Sequences and series of numbers, continuity and differentiability of real valued functions of one variable, the Riemann integral, sequences of functions, and power series. Functions of several variables including partial derivatives, multiple integrals, line and surface integrals. The implicit function theorem.

MATH 413 (113). INTRODUCTION TO COMPLEX VARIABLES. (3)
Prerequisite, MATH 410. The algebra of complex numbers, analytic functions mapping properties of the elementary functions. Cauchy's theorem and the Cauchy integral formula. Residues. (Credit will be given for only one of the courses MATH 413 and MATH 463.)

MATH 414 (114). DIFFERENTIAL EQUATIONS. (3)
Prerequisite, MATH 410. A general introduction to the theory of differential equations. Constructive methods of solution leading to existence theorems and uniqueness theorems. Other topics such as: systems of linear equations, the behavior of solutions in the large, the behavior of solutions near singularities, periodic solutions, stability, and Sturm-Liouville problems.

MATH 415 (165). INTRODUCTION TO PARTIAL DIFFERENTIAL EQUATIONS. (3)
Prerequisites, MATH 410 or MATH 462. Topics will include one dimensional wave equation; linear second order equations in two variables, separations of variables and Fourier series; Sturm-Liouville theory.

MATH 416 (118). INTRODUCTION TO REAL VARIABLES. (3)
Prerequisite, MATH 410. The Lebesgue integral. Fubini's theorem. Convergence theorems. The Lp spaces.

MATH 417 (117). INTRODUCTION TO FOURIER ANALYSIS. (3)
Prerequisite, MATH 410. Fourier series. Fourier and Laplace transforms.

MATH 430 (120). INTRODUCTION TO GEOMETRY I. (3)
Prerequisite, MATH 241 or consent of instructor. Axiomatic development of plane geometries, Euclidean and non-Euclidean. Groups of isometries and similarities.

MATH 431 (121). INTRODUCTION TO GEOMETRY II. (3)
Prerequisite, MATH 430. Non-Euclidean transformation groups, the Erlangen program, projective planes, cubics and quartics.

MATH 432 (122). INTRODUCTION TO POINT SET TOPOLOGY. (3)
Prerequisite, MATH 410 or 450, or equivalent. Connectedness, compactness, transformations, homeomorphisms; application of these concepts to various spaces, with particular attention to the Euclidean plane.

MATH 433 (123). INTRODUCTION TO ALGEBRAIC TOPOLOGY. (3)
Prerequisite, MATH 403 and 432, or equivalent. Chains, cycles, homology groups for surfaces, the fundamental group.

MATH 434 (124). INTRODUCTION TO PROJECTIVE GEOMETRY. (3)
Prerequisite, MATH 241 or equivalent. Recommended for students in the College of Education. Elementary projective geometry, combining synthetic algebraic approaches, projective transformation, harmonic division, cross ratio, projective coordinates, properties of conics.

MATH 436 (126). INTRODUCTION TO DIFFERENTIAL GEOMETRY. (3)
Prerequisite, MATH 241 or equivalent. The differential geometry of curves and surfaces, curvature and torsion, moving frames, the fundamental differential forms, intrinsic geometry of a surface.

MATH 437 (128). EUCLIDEAN GEOMETRY. (3)
Prerequisite, MATH 240 or consent of instructor. Recommended for students in the College of Education. Axiomatic method, models, properties of axioms; proofs of some basic theorems from the axioms; modern geometry of the triangle, circle, and sphere.

MATH 444 (144). ELEMENTARY LOGIC AND ALGORITHMS. (3)
Prerequisite, MATH 240 or consent of instructor. This is the same course as CMSC 444. An informal development of propositional logic, predicate logic, set algebra, and Boolean algebra. Topics include recursive functions, Turing machines, Post productions, Markov algorithms, and word problems.

MATH 446 (147). AXIOMATIC SET THEORY. (3)
Prerequisite, MATH 403 or 450 or consent of instructor. Development of a system of axiomatic set theory, choice principles, induction principles, ordinal arithmetic including discussion of cancellation laws, divisibility, canonical expansions, cardinal arithmetic including connections with the axiom of choice, Hartog's theorem, Konig's theorem, properties of regular, singular, and inaccessible cardinals.

MATH 447 (148). INTRODUCTION TO MATHEMATICAL LOGIC. (3)
Prerequisite, MATH 403 or 450 or 410. Formal propositional logic, completeness, independence, decidability of the system, formal quantificational logic, first order axiomatic theories, extended Godel Completeness theorem, Lowenheim-Skolem theorem, model-theoretical applications.

MATH 450 (146). FUNDAMENTAL CONCEPTS OF MATHEMATICS. (3)
Prerequisite, MATH 240 or consent of instructor. Sets, relations, mappings. Construction of the real number system starting with Peano postulates; algebraic structures associated with the construction; Archimedean order, sequential completeness and equivalent properties of ordered fields. Finite and infinite sets, denumberable and non-denumberable sets.

MATH 460 (168). NUMERICAL METHODS FOR SCIENTISTS AND ENGINEERS. (3)
Prerequisite, MATH 241 or 462 and MATH 246. Interpolation, numerical differentiation and integration, numerical solution of polynomial and transcendental equations, least squares, systems of linear equations, numerical solution of ordinary differential equations, errors in numerical calculations. (This course cannot be counted toward a major in mathematics.)

MATH 462 (162). ANALYSIS FOR SCIENTISTS AND ENGINEERS I. (3)
Prerequisite, MATH 240 or consent of instructor. Credit will be given for only one of the courses MATH 241 and MATH 462. Calculus of functions of several real variables; limits, continuity, partial differentiation, multiple integrals, line and surface integrals, vector-valued functions, theorems of Green, Gauss and Stokes. Physical applications. (This course cannot be counted toward a major in mathematics.)

MATH 463 (163). ANALYSIS FOR SCIENTISTS AND ENGINEERS II. (3)
Prerequisite, MATH 462 or 241 or consent of instructor. Credit will be given for only one of the courses MATH 413 and MATH 463. The complex field. Infinite processes for real and complex numbers. Calculus of complex functions. Analytic functions and analytic continuation. Theory of residues and application to evaluation of integrals. Conformal mapping.

MATH 464 (164). ANALYSIS FOR SCIENTISTS AND ENGINEERS III. (3)
Prerequisite, MATH 246 and MATH 463, or consent of instructor. Fourier and Laplace transforms. Evaluation of the complex inversion integral by the theory of residues. Applications to systems of ordinary and partial differential equations.

MATH 470 (170). NUMERICAL ANALYSIS I. (3)
Prerequisite, MATH 410 (or concurrent registration). A thorough treatment of solutions of equations, interpolation and approximations, numerical differentiation and integration, numerical solution of initial value problems in the solutions of ordinary differential equations.

MATH 471 (171). NUMERICAL ANALYSIS II. (3)
Prerequisite, MATH 400 or 405, and MATH 410 (or concurrent registration). The solution of linear systems by direct and iterative methods, matrix inversion, the evaluation of determinants, eigenvalues and eigenvectors of matrices. Application to boundary value problems in ordinary differential equations. Introduction to the numerical solution of partial differential equations.

MATH 478 (185). SELECTED TOPICS FOR TEACHERS OF MATHEMATICS. (1-3)
Prerequisite, one year of college mathematics or consent of instructor.

MATH 481 (181). INTRODUCTION TO NUMBER THEORY. (3)
Prerequisite, one year of college mathematics or consent of instructor. Designed primarily for those enrolled in programs with emphasis in the teaching of mathematics and science. Not open to students seeking a major directly in the physical sciences, since the course content is usually covered elsewhere in their curriculum. Axiomatic developments of the real numbers. Elementary number theory.

MATH 482 (182). INTRODUCTION TO ALGEBRA. (3)
Prerequisite, one year of college mathematics or consent of instructor. Designed primarily for those enrolled in programs with emphasis in the teaching of mathematics and science. Not open to students seeking a major directly in the physical sciences, since the course content is usually covered elsewhere in their curriculum. Modern ideas in algebra and topics in the theory of equations.

MATH 483 (183). INTRODUCTION TO GEOMETRY. (3)
Prerequisite, one year of college mathematics or consent of instructor. Designed primarily for those enrolled in programs with emphasis in the teaching of mathematics and science. Not open to students seeking a major directly in the physical sciences, since the course content is usually covered elsewhere in their curriculum. A study of the axioms for Euclidean and non-Euclidean geometry.

MATH 484 (184). INTRODUCTION TO ANALYSIS. (3)
Prerequisite, one year of college mathematics or consent of instructor. Designed primarily for those enrolled in programs with emphasis in the teaching of mathematics and science. Not open to students seeking a major directly in the physical sciences, since the course content is usually covered elsewhere in their curriculum. A study of the limit concept and the calculus. (Previous knowledge of calculus is not required.)

MATH 488 (189). NATIONAL SCIENCE FOUNDATION SUMMER INSTITUTE FOR TEACHERS OF SCIENCE AND MATHEMATICS. SEMINAR. (1-3)
Lectures and discussion to deepen the student's appreciation of mathematics as a logical discipline and as a medium of expression. Special emphasis on topics relevant to current mathematical curriculum studies and revisions.

MATH 498 (191). SELECTED TOPICS IN MATHEMATICS. (VARIABLE CREDIT)
Prerequisite, permission of the instructor. Topics of special interest to advanced undergraduate students will be offered occasionally under the general guidance of the departmental Committee on Undergraduate Studies. Honors students register for reading under this number.

STAT 400 (100). APPLIED PROBABILITY AND STATISTICS I. (3)
Prerequisites, MATH 221 or MATH 141. Random variables, common distributions, moments, law of large numbers and central limit theorem. Sampling methods, estimation of parameters, testing of hypotheses, analysis of variance, regression, and correlation.

STAT 401 (101). APPLIED PROBABILITY AND STATISTICS II. (3)
Prerequisites, STAT 400 (MATH 241 recommended). Point estimation, sufficient, unbiased, and consistent estimators. Minimum variance and maximum likelihood estimators. Interval estimation. Testing of hypotheses. Regression and linear hypotheses. Sampling distributions. Experimental designs. Sequential tests, elements of nonparametric methods.

STAT 410 (110). INTRODUCTION TO PROBABILITY THEORY. (3)
Prerequisite MATH 241. Probability and its properties. Random variables and distribution functions in one and several dimensions. Moments. Characteristic functions. Limit theorems.

STAT 411 (111). INTRODUCTION TO STOCHASTIC PROCESSES. (3)
Prerequisite, STAT 410, or MATH 410 and STAT 250. Elementary stochastic processes. Renewal process random walks, branching process, discrete Markov chains, first passage times. Markov chains with a continuous parameter, birth and death processes. Stationary processes and their spectral properties.

STAT 420 (120). INTRODUCTION TO STATISTICS I. (3)
Prerequisite, STAT 410, or STAT 400 and MATH 410. Short review of probability concepts including sampling distributions. Interval estimation. Theory of order statistics. Tolerance limits. Limit distributions and stochastic convergence. Sufficient statistics. Completeness and stochastic independence. Rao-Blackwell theorem.

STAT 421 (121). INTRODUCTION TO STATISTICS II. (3)
Prerequisite, STAT 420, or STAT 401 and MATH 410. Loss and risk functions. Statistical decisions. Optimality criteria. Uniformly minimum risk procedures. Bayesian risk, minimax principle. Point, estimation theory. Statistical hypotheses and optimal tests. Likelihood ratio tests. Elements of linear hypotheses, analysis of variance and sequential theory.

STAT 450 (150). REGRESSION AND VARIANCE ANALYSIS. (3)
Prerequisite, STAT 401 or STAT 420. One, two, three and four way layouts in analysis of variance fixed effects models, linear regression in several variables, Gauss-Markov-theorem, multiple regression analysis, experimental designs.

STAT 464 (164). INTRODUCTION TO BIOSTATISTICS. (3)
Prerequisite, one semester of calculus and junior standing. Probabilistic models. Sampling. Some applications of probability in genetics. Experimental designs. Estimation of effects of treatment. Comparative experiments. Fisher-Irwin test. Wilcoxin tests for paired comparisons.

STAT 470 (170). LINEAR AND NONLINEAR PROGRAMMING. (3)
Prerequisite, MATH 240 or MATH 400. Duality theorem and minimax theorem for finite matrix games. Structure of linear and nonlinear solutions with perturbations. Various solution techniques of linear, quadratic, and convex programming methods. Special integer programming models (transportation and traveling salesman problems). Network theory with max-flow-min-cut theorem.

FOR GRADUATE STUDENTS

See the *Graduate School catalog* for descriptions.

Algebra: 600, 601, 602, 603, 604, 605, 608, 620, 621, 744, 745

Analysis: 630, 631, 632, 633, 634, 635, 648, 660, 661, 666, 668, 670, 671

Geometry and Topology: 606, 607, 640, 641, 730, 731, 734, 735, 740, 742, 744, 745, 746, 748

Applied and Numerical Mathematics: 654, 673, 674, 676, 677, 682, 690, 692, 693, 694, 695, 696, 697, 698

Statistics and Probability: (STAT) 400, 401, 610, 611, 650, 698, 700, 701, 711, 750, 760, 798

Logic and Foundations: 699, 710, 712, 718

Research: 799, 899

MATH 600 (200). ABSTRACT ALGEBRA I. (3)
MATH 601 (201). ABSTRACT ALGEBRA II. (3)
MATH 602 (202). HOMOLOGICAL ALGEBRA. (3)
MATH 603 (203). COMMUTATIVE ALGEBRA. (3)
MATH 604 (208). RING THEORY. (3)
MATH 605 (209). GROUP THEORY. (3)
MATH 606, 607 (227, 228). ALGEBRAIC GEOMETRY. (3, 3)
MATH 608 (271). SELECTED TOPICS IN ALGEBRA. (3)
MATH 620 (206). ALGEBRAIC NUMBER THEORY I. (3)
MATH 621 (207). ALGEBRAIC NUMBER THEORY II. (3)
MATH 630 (286). REAL ANALYSIS I. (3)
MATH 631 (289). REAL ANALYSIS II. (3)
MATH 632, 633 (218, 219). FUNCTIONAL ANALYSIS. (3, 3)
MATH 634, 635 (280, 281). LINEAR SPACES. (3, 3)
MATH 636 (217). BANACH ALGEBRAS. (3)
MATH 640, 641 (204, 205). TOPOLOGICAL GROUPS. (3, 3)
MATH 648 (272). SELECTED TOPICS IN ANALYSIS. (3)
MATH 654 (264). NON-LINEAR ELASTICITY. (3)
MATH 660 (287) COMPLEX ANALYSIS I. (3)
MATH 661 (288). COMPLEX ANALYSIS II. (3)
MATH 664, 665 (282, 283). INTERPOLATION AND APPROXIMATION. (3, 3)
MATH 666 (212). SPECIAL FUNCTIONS. (3)
MATH 668 (278). SELECTED TOPICS IN COMPLEX ANALYSIS (3)
MATH 670, 671 (215, 216). ADVANCED ORDINARY DIFFERENTIAL EQUATIONS. (3, 3)
MATH 673 (265). PARTIAL DIFFERENTIAL EQUATIONS I. (3)
MATH 674 (266). PARTIAL DIFFERENTIAL EQUATIONS II. (3)
MATH 676 (255). NUMERICAL METHODS IN ORDINARY DIFFERENTIAL EQUATIONS. (3)
MATH 677 (256). NUMERICAL METHODS IN PARTIAL DIFFERENTIAL EQUATIONS. (3)
MATH 680, 681 (250, 251). EIGENVALUE AND BOUNDARY VALUE PROBLEMS. (3, 3)
MATH 682 (252) VARIATIONAL METHODS. (3)
MATH 690 (259). INTRODUCTION TO CONTINUUM MECHANICS. (3)
MATH 692, 693 (261, 262). FLUID DYNAMICS. (3, 3)
MATH 694 (267). ADVANCED LINEAR NUMERICAL ANALYSIS. (3)
MATH 695 (263). LINEAR ELASTICITY. (3)
MATH 696 (268). ADVANCED NON-LINEAR NUMERICAL ANALYSIS. (3)
MATH 697 (269). ADVANCED MATHEMATICAL PROGRAMMING. (3)
MATH 698 (274). SELECTED TOPICS IN APPLIED MATHEMATICS. (3)
MATH 699 (298). PRO-SEMINAR IN RESEARCH. (1)
MATH 700, 701 (294, 295). ADVANCED CLASSICAL ANALYSIS. (3, 3)
MATH 710 (240). CONSISTENCY PROOFS IN SET THEORY. (3)
MATH 712 (244). MATHEMATICAL LOGIC I. (3)
MATH 713 (245). MATHEMATICAL LOGIC II. (3)
MATH 715 (246). MODEL THEORY. (3)
MATH 716 (247). RECURSIVE FUNCTION THEORY. (3)
MATH 718 ((277). SELECTED TOPICS IN MATHEMATICAL LOGIC. (3)
MATH 730 (225). TOPOLOGY I. (3)
MATH 731 (226). TOPOLOGY II. (3)
MATH 734, 735 (223, 224). ALGEBRAIC TOPOLOGY. (3, 3)
MATH 737 (296). POINT SET TOPOLOGY. (3)
MATH 740 (222). DIFFERENTIAL GEOMETRY. (3)
MATH 742 (229). DIFFERENTIAL TOPOLOGY. (3)
MATH 744, 745 (290, 291). LIE GROUPS. (3, 3)
MATH 746 (221). DIFFERENTIAL MANIFOLDS. (3)
MATH 748 (273). SELECTED TOPICS IN GEOMETRY AND TOPOLOGY. (3)
MATH 799 (399). THESIS RESEARCH. (Cr Arr)
MATH 899 (499). DISSERTATION RESEARCH. (Cr Arr)
STAT 600 (200). PROBABILITY THEORY I. (3)
STAT 601 (201). PROBABILITY THEORY II. (3)
STAT 610 (212). STOCHASTIC PROCESSES I. (3)
STAT 611 (213). STOCHASTIC PROCESSES II. (3)
STAT 650 (210). APPLIED STOCHASTIC PROCESSES. (3)
STAT 698 (275). SELECTED TOPICS IN PROBABILITY. (3)
STAT 700 (220). MATHEMATICAL STATISTICS I. (3)
STAT 701 (221). MATHEMATICAL STATISTICS II. (3)
STAT 710 (222). ADVANCED STATISTICS I. (3)
STAT 711 (223). ADVANCED STATISTICS II. (3)
STAT 720 (250). NONPARAMETRIC STATISTICS. (3)
STAT 750 (240). MULTIVARIATE ANALYSIS. (3)
STAT 760 (241). SAMPLING THEORY. (3)
STAT 798 (270). SELECTED TOPICS IN STATISTICS. (3)

METEOROLOGY

The Program in Meteorology, part of the Institute for Fluid Dynamics and Applied Mathehatics, offers a number of courses of interest to students in the College of Arts and Sciences.

These courses provide an excellent undergraduate background for those students who wish to do graduate work in the fields of atmospheric and oceanic science, meteorology, air pollution, and other environmental sciences. The interdisciplinary nature of studies in meterology and oceanography assures that all science oriented students will gain a broadened view of physical science as a whole, as well as the manner in which the more pure sciences may be applied to understand the behavior of our environment.

UNDERGRADUATE COURSE WORK IN METEOROLOGY AND OCEANOGRAPHY

METO 410, 411 (110, 111). DESCRIPTIVE AND SYNOPTIC METEOROLOGY. (3, 3)
Prerequisites, MATH 241, PHYS 284 or equivalent. A survey of atmospheric phenomena, goals of research and techniques of study. This course would introduce the new student to the broad range of theoretical and applied studies in meteorology in order to acquaint him with the interaction of the physical and dynamical processes and the various scales of atmospheric phenomena. Some work in synoptic analysis and an introduction to methods of forecasting would be included.

METO 412 (112). PHYSICS AND THERMODYNAMICS OF THE ATMOSPHERE. (3)
Prerequisites, MATH 241, PHYS 284 or equivalent. Optical phenomena, the radiation balance, introduction to cloud physics, atmospheric electrical phenomena, basic therm-

odynamic processes and their application to the atmosphere.

METO 420 (120). PHYSICAL AND DYNAMICAL OCEANOGRAPHY. (3)
Prerequisites, Consent of the Instructor. Historical review of oceanography: physical, chemical, stratification and circulation properties of the ocean; dynamics of frictionless, frictional, wind driven and thermohaline circulations; air-sea interactions.

METO 422 (122). OCEAN WAVES, TIDES AND TURBULENCE. (3)
Prerequisites, ENME 442 or PHYS 461 or equivalent. Introduction to the theory of oceanic wave motions; tides, wind waves, swells, storm surges, seiches, tsunamics, internal waves, turbulence, stirring, mixing and diffusion; probability, statistics and time series.

METO 434 (177). AIR POLLUTION. (3)
Prerequisite, Consent of the instructor. Three lectures per week. Classification of atmospheric pollutants and their effects on visibility, inanimate and animate receptors. Evaluation of source emissions and principles of air pollution control; meteorological factors governing the distribution and removal of air pollutants; air quality measurements and air pollution control legislation.

MICROBIOLOGY

Associate Professor and Chairman: Young.
Professors: Doetsch, Faber (Emeritus), Hansen, Hetrick, Laffer, Pelczar.
Associate Professors: Cook, Roberson.
Assistant Professors: MacQuillan, Vaituzis, Weiner.
Lecturers: Janicki, Stadtman.

The Department of Microbiology has as its primary aim providing the student with thorough and rigorous training in microbiology. This entails knowledge of the basic concepts of bacterial cytology, physiology, taxonomy, metabolism, and genetics, as well as an understanding of the biology of infectious disease, immunology, general virology, and various applications of microbiological principles to public health and industrial processes. In addition, the department pursues a broad and vigorous program of basic research, and encourages original thought and investigation in the above-mentioned areas.

The department also provides desirable courses for students majoring in allied departments who wish to obtain vital, supplementary information. Every effort has been made to present the subject matter of microbiology as a basic core of material that is pertinent to all biological sciences.

The curriculum outlined below, which leads to a bachelor's degree, includes the basic courses in microbiology and allied fields.

A student planning a major in microbiology should consult his advisor during the first year. The supporting courses should be chosen only from the biological or physical sciences.

No course with a grade less than C may be used to satisfy major requirements.

The department has an Honors Program, and information concerning this program may be obtained from the department.

Twenty-four semester hours of microbiology courses are required. This includes MICB 200—General Microbiology (4), and MICB 440—Pathogenic Microbiology (4). At least sixteen additional semester hours must be taken from: MICB 290—Applied Microbiology (4), MICB 300—Microbiological Literature (1), MICB 399—Microbiological Problems (3), MICB 400—Systematic Bacteriology (2), MICB 410—History of Microbiology (1), MICB 420—Epidemiology and Public Health (2), MICB 450—Immunology (4), MICB 460—General Virology (4), MICB 470—Microbial Physiology (4), and MICB 490—Microbial Fermentations (4). Also required as supporting courses are: CHEM 103, 104—College Chemistry I, II (4, 4), CHEM 201, 202—College Chemistry III and College Chemistry Laboratory III (3, 2), CHEM 203, 204—College Chemistry IV and College Chemistry Laboratory IV (3, 2), CHEM 461, 462—Biochemistry (3, 3), MATH 110, 111—Introduction to Mathematics (3, 3) or equivalent, PHYS 121, 122—Fundamentals of Physics (4, 4), ZOOL 101—General Zoology (4), and four additional semester hours of biological sciences. [MATH 220, 221—Introductory Calculus is recommended but not required.]

MICB 200 (001). GENERAL MICROBIOLOGY. (4)
First and second semesters. Summer session. Two lectures and two two-hour laboratory periods a week. Prerequisite, two semesters of chemistry. The biology of microorganisms, with special reference to the bacteria. Fundamental principles of microbiology as revealed through an examination of the structure, physiology, genetics, and ecology of microorganisms. (Weiner)

MICB 290 (081). APPLIED MICROBIOLOGY. (4)
First and second semesters. Summer session. Two lectures and two two-hour laboratory periods a week. Prerequisite, MICB 200. The application of microorganisms and microbiological principles to milk, dairy products, and foods, industrial processes; soil; water and sanitation operations. (Cook)

MICB 300 (162). MICROBIOLOGICAL LITERATURE. (1)
Second semester. One lecture period a week. Prerequisite, a major in microbiology. Introduction to periodical literature, methods, interpretation, and presentation of reports. (Doetsch)

MICB 399 (181). MICROBIOLOGICAL PROBLEMS. (3)
First and second semesters. Summer session. Prerequisite, 16 credits in microbiology. Registration only upon the consent of the instructor. This course is arranged to provide qualified majors in microbiology and majors in allied fields an opportunity to pursue specific microbiological problems under the supervision of a member of the department. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

MICB 400 (160). SYSTEMATIC BACTERIOLOGY. (2)
First semester. Two lecture periods a week. Prerequisite, 8 credits in microbiology. History of bacterial classification; genetic relationships; international codes of nomenclature; bacterial variation as it affects classification. (Hansen)

MICB 410 (104). HISTORY OF MICROBIOLOGY. (1)
First semester. One lecture period a week. Prerequisite, a major or minor in microbiology. History and integration of the fundamental discoveries of the science. The modern aspects of cytology, taxonomy, fermentation, and immunity in relation to early theories. (Doetsch)

MICB 420 (108). EPIDEMIOLOGY AND PUBLIC HEALTH. (2)
Second semester. Two lecture periods a week. Prerequisite, MICB 200. History, characteristic features, and epidemiology of the important communicable diseases,

public health administration and responsibilities; vital statistics. (Faber)

MICB 440 (101). PATHOGENIC MICROBIOLOGY. (4)
First semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, MICB 200. The role of microorganisms in the diseases of man and animals with emphasis upon the differentiation and culture of microorganisms, types of disease, modes of disease transmission, prophylactic, therapeutic, and epidemiological aspects. (Vaituzis)

MICB 450 (103). IMMUNOLOGY. (4)
Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, MICB 440. Infection and resistance; principles and types of immunity; hypersensitiveness. Fundamental techniques of immunology. (Roberson)

MICB 460 (111). GENERAL VIROLOGY. (4)
Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, MICB 440 or equivalent. Basic concepts regarding the nature of viruses and their properties, together with techniques for their characterization and identification. (Hetrick)

MICB 470 (151). MICROBIAL PHYSIOLOGY. (4)
First semester. Two lectures and two two-hour laboratory periods a week. Prerequisites, 8 credits in microbiology and CHEM 201, 202, or equivalent. Aspects of the growth, death, and energy transactions of microorganisms are considered, as well as the effects of the physical and chemical environment on them. (MacQuillan)

MICB 490 (121). MICROBIAL FERMENTATIONS. (4)
Second semester. Two lectures and two two-hour laboratory periods a week. Prerequisite, consent of instructor. The application of quantitative techniques for measurement of enzyme reactions, mutations, fermentation, analyses, and other physiological processes of microorganisms. (Cook)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

MICB 674 (204). BACTERIAL METABOLISM. (2)

MICB 688, 689 (206, 208). SPECIAL TOPICS. (1-4, 1-4)

MICB 704 (201). MEDICAL MYCOLOGY. (4)

MICB 714 (271). CYTOLOGY OF BACTERIA. (4)

MICB 750 (230). ADVANCED IMMUNOLOGY. (2)

MICB 751 (231). IMMUNOLOGY LABORATORY. (2)

MICB 760 (210). VIROLOGY AND TISSUE CULTURE. (2)

MICB 761 (211). VIROLOGY AND TISSUE CULTURE LABORATORY. (2)

MICB 774 (214). ADVANCED BACTERIAL METABOLISM. (1)

MICB 780 (202). GENETICS OF MICROORGANISMS. (2)

MICB 781 (203). MICROBIAL GENETICS LABORATORY. (2)

MICB 788, 789 (280, 282). SEMINAR. (1, 1)

MICB 799 (399). THESIS RESEARCH (Master's Level). (Var.)

MICB 899 (499). DISSERTATION RESEARCH (Doctoral Level). (Var.)

MOLECULAR PHYSICS

Associate Professor and Director: Munn.

Professors: Benesch and Benedict.

Research Professor: Zwanzig.*

Associate Professors: Krisher, DeRocco, Sengers, Ginter.

Visiting Associate Professors: Tilford (P.T.) and Ernst.

Research Associates: Chang and Gillespie.

The Institute for Molecular Physics serves as an ideal place to bring together physicists and chemists to work on problems of mutual interest to the advantage of both. The graduate degree program in chemical physics is administered jointly by the Institute and the Chemistry and Physics Departments.

The current research activities include theoretical and experimental studies in the broad fields of intermolecular forces (equation of state of liquids and gases, critical phenomena, transport phenomena in gases and plasmas, molecular collisions and scattering processes, biological systems, solid-state phenomena at high pressures), molecular structure (spectroscopy from the microwave to the vacuum ultraviolet, upper atmospheric and auroral phenomena, planetary atmospheres, potential energy curves, molecular quantum mechanics), and chemical and physical kinetics.

Since the faculty of the institute feels strongly that students should fulfill the undergraduate requirements in one of the traditional departments to insure a broad background in a fundamental subject, no undergraduate degree is offered. Members of the institute teach both undergraduate and graduate courses in the Department of Chemistry and the Department of Physics and Astronomy and supervise thesis research of graduate students in these departments. The institute also participates in a graduate degree program in chemical physics which is jointly administered by the institute, the Department of Chemistry, and the Department of Physics and Astronomy. This program is described in the *Graduate School catalog.*

*Joint appointment with Fluid Dynamics and Applied Mathematics.

MUSIC

Professor and Head: Troth.

Professors: Berman, Bernstein, deVermond, Gordon, Grentzer, Heim, Helm, Johnson, McCorkle, Moss, Traver, Ulrich.

Associate Professors: Blum, Garvey, Head, Hudson, Meyer, Montgomery, Nossaman, Pennington, Springmann, Taylor.

Assistant Professors: Anderson, Fanos, Gallagher, Gould, Haley, McClelland, Olson, Payerle, Schumacher, Seidler, Serwer, Shelley, Skidmore, True, Wakefield, Wilson, Winden.

Instructors: Barnett, Beatty, Davis, Etheridge, Heath, Mueller, Steinke, Wachhaus.

The functions of the department are (1) to help the general student develop sound critical judgment and discriminating taste in the art of music; (2) to provide professional training based on a foundation in the liberal arts; (3) to prepare the student for graduate work in the field; and (4) to prepare him to teach in the public schools. To this end, two degrees are offered: the Bachelor of Music, with a major in theory and composition, history and literature, or applied music; and the Bachelor of Arts, with a major in music. The Bachelor of Science degree, with a major in music education, is offered in the College of Education; this

program, however, is administered within the Music Department.

Courses in music theory, literature and applied music are open to all students who have completed the specified prerequisites or their equivalents. The University Bands, Chamber Chorus, Choir, Madrigal Singers, Men's Glee Club, Orchestra, and Women's Chorus, as well as the smaller ensembles, are likewise open to qualified students.

THE BACHELOR OF MUSIC DEGREE

The curriculum leading to the degree of Bachelor of Music is designed for students who wish to prepare for music teaching on the college level. A list of specific courses is available in the departmental office. A grade of C or above is required in each major course. The course requirements in the three major areas may be summarized as follows:

Major in	*Theory and Composition sem. hrs.*	*History and Literature sem. hrs.*	*Applied Music sem. hrs.*
Academic Courses:			
Specified*	43	43	43
Unspecified	8	8	9
Theory and Literature:			
Lower Division	27	23	23
Upper Division	16	22	13
Applied Music:	26	24	32

*In addition; eight semester hours in ensemble courses.

THE BACHELOR OF ARTS DEGREE

The curriculum leading to the Bachelor of Arts degree with a major in music is designed for students whose interests are cultural rather than professional. The departmental requirements include nineteen semester hours in music theory, eighteen semester hours in music history and literature, ten semester hours in applied music, in addition to one semester hour of ensemble credit for each semester in residence. A list of specific courses is available in the departmental office. A grade of C or above is required in each major course.

MUSC 008 (000A). GRADUATE COLLOQUIUM. (0)
Required of all master's and doctoral students in the Music Department. A colloquium given by guest lecturers on alternate weeks on a variety of topics of professional interest. (Staff)

MUSC 009 (000B). GRADUATE ENSEMBLE. (0)
Required of all master's and doctoral students in Applied Music. Participation in departmental ensembles according to the student's major instrument, and as determined by the student's advisor. (Staff)

MUSC 100, 101 (021, 022). CLASS VOICE. (2, 2)
Four hours per week. A laboratory course in which a variety of voices and vocal problems are represented. Principles of correct breathing as applied to singing; fundamentals of tone production and diction. Students are taught to develop their own voices. Repertoire of folk songs and songs of the Classical and Romantic periods. (Nossaman)

MUSC 102, 103 (023, 024). CLASS PIANO. (2, 2)
Four hours per week. Functional piano training for beginners. Development of techniques useful for school and community playing. Basic piano techniques; chord, arpeggio, and scale techniques; melody and song playing; simple accompaniments, improvisation for accompaniments and rhythms; sight reading and transposition, and playing by ear. MUSC 103, continuation of MUSC 102; elementary repertoire is begun. (Staff)

MUSC 110 (080). CLASS STUDY OF STRING INSTRUMENTS. (2)
First semester. Open only to majors in music education (vocal option). Four laboratory hours per week. Basic principles of string playing, and a survey of all string instruments. (Berman)

MUSC 111 (081). CLASS STUDY OF WIND AND PERCUSSION INSTRUMENTS. (2)
Second semester. Open only to majors in music education (vocal option). Four laboratory hours per week. A survey of wind and percussion instruments with emphasis on ensemble training. The student will acquire an adequate playing technique on one instrument and gain an understanding of the acoustical and construction principles of the others. (Staff)

MUSC 113, (061), 114 (062), 116 (063), 117 (064), 120 (065), 121 (066), 122 (067). CLASS STUDY OF ORCHESTRAL AND BAND INSTRUMENTS. (2 each course)
First and second semesters alternately. Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the instruments with emphasis on ensemble training. The student will acquire an adequate playing technique on two to four instruments, and an understanding of the acoustical and construction principles of the others. MUSC 113, Violin; MUSC 114, Cello and Bass; MUSC 116, Clarinet; MUSC 117, Flute, Oboe, Bassoon, and Saxophone; MUSC 120, Cornet; MUSC 121, Horn, Trombone, Euphonium, and Tuba; MUSC 122, Percussion. (Staff)

MUSC 129. MUSIC ENSEMBLE. (1)
Three laboratory hours per week. Rehearsal and performance of selected works for small ensembles of instruments, piano, or small vocal groups. After two registrations in MUSC 129 the student will elect MUSC 229 for two additional semesters, and MUSC 329 thereafter. In addition to indicating the course number (129, 229, or 329) the student will indicate a section as follows: (Staff)

Sec.		Sec.	
A	Men's Glee Club (004)	J	Brass Choir (009D)
B	Women's Chorus (005)	K	Percussion En. (009G)
C	Chapel Choir (015)	L	Clarinet Choir (009C)
D	Chamber Chorus (009F)	M	Saxophone En. (009L)
E	Madrigal Singers (009A)	N	String Ensemble (009B)
F	Opera Workshop (009H)	O	Woodwind En. (009J)
G	University Orch. (006)	P	Keyboard En. (009K)
H	Theater Orch. (009E)	Q	Chamber Orch. (006)
I	Bands (010)	Z	University Chorus (009F)

MUSC 130 (020). SURVEY OF MUSIC LITERATURE. (3)
Three lectures and one laboratory hour per week. Open to all students except music and music education majors. MUSC 130 and 131 may not both be taken for credit. A study of the principles upon which music is based, and an introduction to the musical repertoires performed in America today. (Davis and Staff)

MUSC 131 (001). INTRODUCTION TO MUSIC. (3)
Open only to music or music education majors; other students take MUSC 130. MUSC 130 and 131 may not both be counted for credit. A study of the forms and styles of music, leading to an intelligent appreciation of the art and providing a foundation for more advanced courses in the Department of Music. (Serwer, Ulrich)

MUSC 150, 151 (007, 008). THEORY OF MUSIC. (3, 3)
Two lectures and three laboratory hours per week. A fundamental course in the elements of music. Study of rhythms, scales, chord structures, and tonalities through ear training, sight singing, and keyboard drill. The student must achieve a grade of C in MUSC 151 in order to register for MUSC 250. (Payerle and Staff)

MUSC 155 (016). FUNDAMENTALS FOR THE CLASSROOM TEACHER. (3)
Open to students majoring in elementary education or childhood education; other students take MUSC 150. MUSC 150 and 155 may not both be counted for credit. The fundamentals of music theory and practice, related to the needs of the classroom and kindergarten teacher, and organized in accord with the six-area concept of musical learning. (Fanos and Staff)

MUSC 200, 201 (031, 032). ADVANCED CLASS VOICE. (2, 2)
Four hours per week. Prerequisite, MUSC 101 or equivalent vocal training. Continuation of MUSC 101, with more advanced repertoire for solo voice and small ensembles. A special section for music-education majors will include the study of methods and materials for teaching class voice. (Pennington)

MUSC 202, 203 (033, 034). ADVANCED CLASS PIANO. (2, 2)
Four hours per week. Prerequisite, MUSC 103 or equivalent piano training. Advanced keyboard techniques. Continuation of skills introduced in MUSC 103, transposition, modulation, and sight reading; methods of teaching functional piano. MUSC 203, development of style in playing accompaniments and in playing for community singing. More advanced repertoire. (de Vermond)

MUSC 205 (054). PIANO SIGHT READING, ACCOMPANYING, AND IMPROVISATION. (2)
Prerequisite, completion or current registration in MUSC 208A. Four laboratory hours per week. A course designed to improve sight-reading fluency for pianists. Emphasis on vocal and instrumental accompanying and chamber music. Development of ability to improvise and transpose. May be repeated for credit. (Staff)

MUSC 213 (068). ADVANCED CLASS—STRINGS. (2)
Open only to majors in music education (instrumental option). Four laboratory hours per week. A study of the instruments with emphasis on ensemble training. (Berman)

MUSC 229. MUSIC ENSEMBLE. (1)
See description under MUSC 129.

MUSC 250, 251 (070, 071). ADVANCED THEORY OF MUSIC. (4, 4)
Prerequisite, MUSC 151 with a grade of at least C. Three lectures and two laboratory hours per week. An integrated course of written harmony, keyboard harmony, and ear training. Continuation of the principles studied in MUSC 151. Harmonic progressions; MUSC 250, eighteenth-century chorale style; MUSC 251, nineteenth-century styles including chromatic and modulatory techniques. Realization of figured basses, and composition in the smaller forms. Advanced study of solfege, with drill in melodic, rhythmic, and harmonic dictation. Application of harmonic principles to the keyboard. (Payerle and Staff)

MUSC 329. MUSIC ENSEMBLE. (1)
See description under MUSC 129.

MUSC 330, 331 (120, 121). HISTORY OF MUSIC. (3, 3)
Prerequisites, MUSC 130 or 131 and junior standing. A study of musical styles from their origins in western Europe to their present-day manifestations. The interaction of music and other cultural activities. MUSC 330, the Greek period to Bach; MUSC 331, Bach to the present. (Helm, Serwer)

MUSC 339 (125). HONORS READING COURSE (2-3)
Prerequisites, junior standing and consent of Honors Committee. Selected readings in the history, literature and theory of music. The course may be repeated for credit at the discretion of the committee. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

MUSC 350 (155). AURAL MUSICAL SKILLS. (3)
First and second semesters. Development of advanced skills in aural perception of pitch, melody, rhythm, harmony, text, texture, and timbre heard in a variety of media. A development course for graduate students. May be repeated for credit. (Staff)

MUSC 400 (185). MUSIC PEDAGOGY. (3)
Conference course. Pre- or corequisite, MUSC 418 or a more advanced course in applied music. A study of major pedagogical treatises in music, and an evaluation of pedagogical techniques, materials, and procedures. (Staff)

MUSC 430, 431 (130, 131). MUSIC LITERATURE SURVEY FOR THE NON-MAJOR. (3, 3)
Either semester may be taken separately. Prerequisite, MUSC 130 or the equivalent. Open to all students except music and music-education majors. Selected compositions are studied from the standpoint of the informed listener. MUSC 430, choral music, opera, and art song; MUSC 431, orchestral, chamber, and keyboard music. (Seidler)

MUSC 440 (165). KEYBOARD MUSIC. (3)
Prerequisite, MUSC 330, 331, or the equivalent. The history and literature of harpsichord, organ, and piano music from the Baroque period to the present. Suites, sonatas and smaller forms are studied with emphasis on changes of style and idiom. (Gordon)

MUSC 441 (168). CHAMBER MUSIC. (3)
Prerequisite, MUSC 330, 331, or the equivalent. The history and literature of chamber music from the early Baroque period to the present. Music for trio sonata, string quartet and quintet, and combinations of piano and strings. (Ulrich)

MUSC 442 (167). SYMPHONIC MUSIC. (3)
Prerequisite, MUSC 330, 331, or the equivalent. The study of orchestral music from the Baroque period to the present. The concerto, symphony, overture, and other forms are examined. (McCorkle)

MUSC 443 (164). SOLO VOCAL LITERATURE. (3)
Prerequisite, MUSC 330, 331, or the equivalent. The study of solo vocal literature from the Baroque cantata to the art song of the present. The *Lied, melodie,* vocal chamber music, and the orchestral song are examined. (Pennington)

MUSC 444 (169). CHORAL MUSIC. (3)
Prerequisite, MUSC 330, 331, or the equivalent. The history and literature of choral music from the Renaissance to the present, with discussion of related topics such as Gregorian chant, vocal chamber music, etc. (Helm)

MUSC 445 (166). SURVEY OF THE OPERA. (3)
Prerequisite, MUSC 330, 331, or the equivalent. A study of the music, librettos and composers of the standard operas. (Winden)

MUSC 446 (163). CONTEMPORARY MUSIC. (3)
Prerequisites, MUSC 330, 331, or the equivalent. A study of music written in contemporary idioms since Debussy. Changes in form and performing media in the twentieth century. Electronic music and other experimental types. (Moss)

MUSC 448 (190). SPECIAL AREAS OF MUSIC. (3)
Prerequisites, MUSC 330, 331, or the equivalent. Three lectures per week. The course will be offered periodically in various disciplines. (Staff)

MUSC 450 (141). MUSICAL FORM. (3)
Prerequisite, MUSC 250, 251. A study of the organizing principles of musical composition, their interaction in musical forms, and their functions in different styles. (Gould)

MUSC 460, 461 (145, 146). COUNTERPOINT. (2, 2)
Prerequisite, MUSC 250, 251. A course in eighteenth-century contrapuntal techniques. Study of devices of imitation in the invention and the choral prelude. Original writing in the smaller contrapuntal forms. (Gould)

MUSC 462 (149). MODAL COUNTERPOINT. (2)
Prerequisite, MUSC 251 or the equivalent. An introduction to the contrapuntal techniques of the sixteenth

century: the structure of the modes, composition of modal melodies, and contrapuntal writing for two, three and four voices. (Gould)

MUSC 465 (175). CANON AND FUGUE. (3)
Prerequisite, MUSC 461 or the equivalent. Composition and analysis of the canon and fugue in the styles of the eighteenth, nineteenth and twentieth centuries. (Gould)

MUSC 470 (150). HARMONIC AND CONTRAPUNTAL PRACTICES OF THE TWENTIETH CENTURY. (2)
Prerequisites, MUSC 251 and 460 or the equivalents. A theoretical study of twentieth-century materials: scales, modes, intervals, chord structures, poly-harmony, and serial and twelve-tone organization. (Moss)

MUSC 478, 479 (143, 144). COMPOSITION. (2, 2)
Prerequisite, MUSC 250, 251. Principles of musical composition, and their application to the smaller forms. Original writing in nineteenth and twentieth century musical idioms for various media. (Moss)

MUSC 486, 487 (147, 148). ORCHESTRATION. (2, 2)
Prerequisite, MUSC 250, 251. A study of the ranges, musical functions, and technical characteristics of the instruments, and their color possibilities in various combinations. Practical experience in orchestrating for small and large ensembles. (Steinke)

MUSC 490, 491 (160, 161). CONDUCTING. (2, 2)
MUSC 490 or equivalent is prerequisite to MUSC 491. A laboratory course in conducting vocal and instrumental groups. Baton technique, score reading, rehearsal techniques, tone production, style, and interpretation. Music of all periods will be introduced. (Hudson, Taylor)

MUSC 495 (180). ACOUSTICS FOR MUSICIANS. (3)
Prerequisites, MUSC 251 or the equivalent, and senior or graduate standing in music. The basic physics of music, acoustics of musical instruments and music theory, physiological acoustics, and musico-architectural acoustics. (Staff)

FOR GRADUATES

See *Graduate School catalog* for descriptions.

MUSC 605 (182). CHAMBER MUSIC REPERTOIRE. (3)

MUSC 609 (212). INTERPRETATION AND REPERTOIRE. (2)

MUSC 610 (213). GRADUATE PERFORMANCE. (4)

MUSC 630 (218). TEACHING THE THEORY, HISTORY AND LITERATURE OF MUSIC. (3)

MUSC 635 (204). AMERICAN MUSIC. (3)

MUSC 638 (200). ADVANCED STUDIES IN THE HISTORY OF MUSIC. (3)

MUSC 639 (201). SEMINAR IN MUSIC. (3)

MUSC 648 (202). PRO-SEMINAR IN THE HISTORY AND LITERATURE OF MUSIC. (3)

MUSC 649 (203). SEMINAR IN MUSICOLOGY. (3)

MUSC 650 (207). THE CONTEMPORARY IDIOM. (3)

MUSC 662 (206). ADVANCED MODAL COUNTERPOINT. (3)

MUSC 670, 671 (270, 271). ADVANCED ANALYTICAL TECHNIQUES. (3, 3)

MUSC 678 (209). SEMINAR IN MUSICAL COMPOSITION. (3)

MUSC 688 (208). ADVANCED ORCHESTRATION. (3)

MUSC 689 (260). ADVANCED CONDUCTING. (3)

MUSC 695 (215). AESTHETICS OF MUSIC. (3)

MUSC 696 (210). FACTORS IN MUSICAL LEARNING. (3)

MUSC 699 (211). SPECIAL STUDIES IN MUSIC. (3)

MUSC 799 (399). MASTER'S THESIS RESEARCH. (3-6)

MUSC 800, 801 (285, 286). ADVANCED SEMINAR IN MUSIC PEDAGOGY. (3, 3)

MUSC 805, 806, 807 (312, 313, 314). INTERPRETATION, PERFORMANCE, AND PEDAGOGY. (4, 4, 4)

MUSC 830, 831 (300, 301). DOCTORAL SEMINAR IN MUSIC LITERATURE. (3, 3)

MUSC 839 (305). DOCTORAL SEMINAR IN MUSICOLOGY. (3)

MUSC 878 (306). ADVANCED COMPOSITION. (3)

MUSC 899 (499). DOCTORAL DISSERTATION RESEARCH. (3-6)

APPLIED MUSIC

A new student or one taking applied music for the first time at this University should register for MUSC 099. He will receive the proper classification at the end of his first semester in the department. Special fee of $40.00 per semester for each applied-music course.

Section designation: Each student taking an applied-music course should, in addition to registering for the proper course number, indicate the instrument chosen by adding a section as follows:

Sec. A,	Piano	Sec. J,	Bassoon
Sec. B,	Voice	Sec. K,	Alto Saxophone
Sec. C,	Violin	Sec. L,	Horn
Sec. D,	Viola	Sec. M,	Trumpet
Sec. E,	Cello	Sec. N,	Trombone
Sec. F,	Bass	Sec. O,	Tuba
Sec. G,	Flute	Sec. P,	Euphonium
Sec. H,	Oboe	Sec. Q,	Percussion
Sec. I,	Clarinet	Sec. R,	Organ

MUSC 108, 109 (012, 013). APPLIED MUSIC. (2-4, 2-4)
Freshman course. One hour lesson and six practice hours per week if taken for two hours credit; or one hour lesson and fifteen practice hours per week if taken for four hours credit. The four-hour course is for piano majors in the B.Mus. curriculum only. Special fee of $40.00 per semester. (Staff)

MUSC 208, 209 (052, 053). APPLIED MUSIC. (2-4, 2-4)
Sophomore course. Prerequisite, MUSC 109 on the same instrument. One hour lesson and six practice hours per week if taken for two hours credit; or one hour lesson and fifteen practice hours per week if taken for four hours credit. The four-hour course is for instrumental majors in the B.Mus. curriculum only. Special fee of $40.00 per semester. (Staff)

MUSC 408, 409 (112, 113). APPLIED MUSIC. (2-4, 2-4)
Junior course. Prerequisite, MUSC 209 on the same instrument. One hour lesson and six practice hours per week if taken for two hours credit; or one hour lesson and fifteen practice hours per week if taken for four hours credit. The four-hour course is for instrumental majors in the B.Mus. curriculum only. Special fee of $40.00 per semester.

MUSC 418, 419 (152, 153). APPLIED MUSIC. (2-4, 2-4)
Senior course. Prerequisite, MUSC 409 on the same instrument. One hour lesson and six practice hours per week if taken for two hours credit; or one hour lesson and fifteen practice hours per week if taken for four hours credit. The four-hour course is for instrumental or vocal majors in the B.Mus. curriculum only. Special fee of $40.00 per semester. (Staff)

For applied music on the graduate level, see MUSC 609, 610, 805, 806, and 807 above.

For all applied music courses the student should, in addition to registering for the proper course number, indicate the instrument chosen by adding a section number as shown under MUSC 099.

PHILOSOPHY

Professor and Chairman: Schlaretzki
Professor: Pasch.
Associate Professors: Brown, Celarier, Perkins, Svenonius.
Assistant Professors: Johnson, Kress, Lesher, Martin, Odell, Varnedoe.

The Department of Philosophy presents visiting speakers from this country and abroad in its colloqium series, scheduled throughout the academic year. In addition, members of the department and advanced graduate students lecture on topics of current significance in the Graduate Workshop and in the undergraduate Philosophy Club.

The undergraduate course offerings of the Department of Philosophy are, as a group, intended both to satisfy the needs of persons wishing to make philosophy their major field and to provide ample opportunity for other students to explore the subject. In general, the study of philosophy can contribute to the education of the university student by giving him experience in critical and imaginative reflection on fundamental concepts and principles, by acquainting him with some of the philosophical beliefs which have influenced and are influencing his own culture, and by familiarizing him with some classic philosophical writings through careful reading and discussion of them. Courses designed with these objectives primarily in mind are PHIL 100 (Introduction to Philosophy), PHIL 170 (Elementary Logic and Semantics), PHIL 140 (Ethics), PHIL 236 (Philosophy of Religion), and the historical courses 305, 310, 320, 325, and 326.

For students interested particularly in philosophical problems arising within their own special disciplines, a number of appropriate courses are available: PHIL 233 (Philosophy in Literature), PHIL 250 (Philosophy of Science), PHIL 343 (The Conflict of Ideals in Western Civilization), PHIL 360 (Philosophy of Language), PHIL 330 (Philosophy of Art), PHIL 457 (Philosophy of History), PHIL 444 (Political and Social Philosophy), PHIL 450 (Topics in the Philosophy of Science), and PHIL 474 (Induction and Probability).

The departmental requirements for a major in philosophy are as follows: (1) a total of at least 30 hours in philosophy, not including PHIL 100; (2) PHIL 140, 271, 310, 320, 326, and at least two courses numbered 399 and above; (3) a grade of C or better in each course counted toward the fulfillment of the major requirement.

For students of exceptional ability and interest in philosophy, the department offers an honors program. Information regarding this special curriculum may be obtained from the departmental advisors.

PHIL 100 (001). INTRODUCTION TO PHILOSOPHY. (3)
An introduction to some of the main problems of philosophy, and to some of the main ways of dealing with these problems. (Staff)

PHIL 140 (045). ETHICS. (3)
An introduction to moral philosophy, including a critical examination of some important classic and contemporary systems of ethics, such as those of Aristotle, Kant, Mill, and Dewey. (Staff)

PHIL 170 (041). ELEMENTARY LOGIC AND SEMANTICS. (3)
An introductory study of logic and language, intended to help the student increase his ability to employ language with understanding and to reason correctly. Topics treated include the use and abuses of language, techniques for making sound inferences and the logic of science. (Staff)

PHIL 233 (052). PHILOSOPHY IN LITERATURE. (3)
Reading and philosophical criticism of novels and dramas containing ideas significant for ethics, social policy and religion. (Perkins)

PHIL 236 (053). PHILOSOPHY OF RELIGION. (3)
This course seeks to provide the student with the means by which he may approach intelligently the main problems of religious thought: the nature of religious experience, the forms of religious expression, the conflicting claims of religion and science, and the place of religion in the community, and in the life of the individual. (Brown)

PHIL 250 (056). PHILOSOPHY OF SCIENCE. (3)
An introductory study of the aims, procedures and results of scientific inquiry. Topics discussed include the formulation and testing of hypotheses, induction and probability, scientific laws, theories and explanation, concept formation, and relationships among the special sciences. (Staff)

PHIL 271 (055). SYMBOLIC LOGIC I. (3)
An introduction to the formal analysis of deductive reasoning through formalization of arguments, truth table and natural deduction techniques for propositional logic and quantification theory, including identity and definite descriptions. (Celarier, Varnedoe)

PHIL 305 (105). PHILOSOPHY IN AMERICA. (3)
Prerequisite, six hours in philosophy. A survey of philosophical thought in America from the eighteenth century to the present. Special attention is given to Edwards, Jefferson, Emerson, Royce, Peirce, James, and Dewey. (Varnedoe)

PHIL 307 (120). ORIENTAL PHILOSOPHY. (3)
Prerequisite, one course in philosophy. Not offered on College Park campus. An examination of the major philosophical systems of the East, attempting to discover the relations between these and important ideas of Western thought.

PHIL 310 (101). ANCIENT PHILOSOPHY. (3)
Prerequisites, six hours in philosophy. A history of Greek thought from its beginnings to the time of Justinian. The chief figures discussed: The Presocratic philosophers, Socrates, Plato, Aristotle, Epicurus, the Stoic philosophers, and Plotinus. (Lesher,Celarier)

PHIL 320 (102). MODERN PHILOSOPHY. (3)
Prerequisites, six hours in philosophy. A history of philosophical thought in the West during the 16th, 17th, and 18th centuries. The chief figures discussed: Bacon, Galileo, Descartes, Spinoza, Leibniz, Locke, Berkeley, Hume, and Kant. (Varnedoe)

PHIL 325 (103). NINETEENTH-CENTURY PHILOSOPHY. (3)
Prerequisites, six hours in philosophy. A survey of philosophy in the nineteenth century through a consideration of such writers as Hegel, Schopenhauer, Nietzsche, Spencer, Marx, Comte, Mill, Mach, and Bradley. (Lesher)

PHIL 326 (104). TWENTIETH-CENTURY PHILOSOPHY. (3)
Prerequisites, six hours in philosophy. A survey of philosophy in the twentieth century through a consideration of representative figures in England, Europe and America. Among the theories to be studied are logical atomism (Russell, Wittgenstein), positivism (Carnap, Ayer), exis-

tentialism and phenomenology (Sartre, Husserl), naturalism and realism (Dewey, Santayana).
(Brown, Martin, Odell)

PHIL 330 (147). PHILOSOPHY OF ART. (3)
An examination of the fundamental concepts in art and in esthetic experience generally. Readings from the works of artists, estheticians, critics and philosophers.
(Brown)

PHIL 343 (130). THE CONFLICT OF IDEALS IN WESTERN CIVILIZATION. (3)
A critical and constructive philosophical examination of the assumptions, goals, and methods of contemporary democracy, fascism, socialism, and communism, with special attention to the ideological conflict between the U.S.A. and the U.S.S.R. (Staff)

PHIL 360 (141). PHILOSOPHY OF LANGUAGE. (3)
Prerequisite, PHIL 170 or 271. An inquiry into the nature and function of language and other forms of symbolism.
(Kress)

PHIL 388, 389 (191, 192). TOPICAL INVESTIGATIONS. (1-3)

PHIL 399 (190). HONORS SEMINAR. (3)
Each semester. Open to honors students in philosphy and, by permission of the instructor, to honors students in other departments. Research in selected topics, with group discussion. May be repeated for credit when the topics dealt with are different. (Staff)

PHIL 408 (169). TOPICS IN CONTEMPORARY PHILOSOPHY. (3)
Prerequisite, PHIL 320. An intensive examination of contemporary problems and issues. Source material will be selected from recent books and articles. May be repeated for credit when the topics dealt with are different.
(Staff)

PHIL 412 (180). THE PHILOSOPHY OF PLATO. (3)
Prerequisites, PHIL 310 and 320. A critical study of selected dialogues. (Lesher)

PHIL 414 (181). THE PHILOSOPHY OF ARISTOTLE. (3)
Prerequisites, PHIL 310 and 320. A critical study of selected portions of Aristotle's writings. (Lesher)

PHIL 416 (182). MEDIEVAL PHILOSOPHY. (3)
Prerequisites, PHIL 310 or 320. A history of philosophic thought in the West from the close of the Classical period to the Renaissance. Based on readings of the Stoics, early Christian writers, Neoplatonists, later Christian writers, and Schoolmen. (Staff)

PHIL 421 (184). THE CONTINENTAL RATIONALISTS. (3)
Prerequisites, PHIL 310 and 320. A critical study of the systems of some of the major 17th and 18th century rationalists, with special reference to Descartes, Spinoza, and Leibniz. (Staff)

PHIL 422 (185). THE BRITISH EMPIRICISTS. (3)
Prerequisites, PHIL 310 and 320. A critical study of selected writings of Locke, Berkeley, and Hume.
(Varnedoe)

PHIL 423 (186). THE PHILOSOPHY OF KANT. (3)
Prerequisites, PHIL 310 and 320. A critical study of selected portions of Kant's writings. (Staff)

PHIL 428 (168). TOPICS IN THE HISTORY OF PHILOSOPHY. (3)
Prerequisite, PHIL 310 and 320, or consent of instructor. May be repeated for credit when the topics dealt with are different. (Staff)

PHIL 440 (151). ETHICAL THEORY. (3)
Prerequisite, PHIL 140. Contemporary problems having to do with the meaning of the principal concepts of ethics and with the nature of moral reasoning. (Schlaretzki)

PHIL 444 (154). POLITICAL AND SOCIAL PHILOSOPHY. (3)
A systematic treatment of the main philosophical issues encountered in the analysis and evaluation of social (especially political) institutions. (Johnson, Schlaretzki)

PHIL 447 (158). PHILOSOPHY OF LAW. (3)
Prerequisite, one course in philosophy. Examination of fundamental concepts related to law, e.g., legal system, law and morality, justice, legal reasoning, responsibility.
(Johnson)

PHIL 450 (156). TOPICS IN THE PHILOSOPHY OF SCIENCE. (3)
Prerequisite, PHIL 250 or consent of instructor. Detailed examination of some basic issues in the methodology and conceptual structure of scientific inquiry. To be investigated are such topics as confirmation theory, structure and function of scientific theories, scientific explanation, concept formation, and theoretical reduction. (Staff)

PHIL 455 (159). PHILOSOPHY OF THE SOCIAL SCIENCES. (3)
Prerequisites, six hours in social science or consent of instructor. A discussion of several of the following topics: the nature of laws and explanation in the social sciences; the relation of the social sciences to mathematics, logic, and the natural sciences; the role of value judgments in the social sciences; the relation of social science to social policy; problems of methodology. (Staff)

PHIL 457 (152). PHILOSOPHY OF HISTORY. (3)
An examination of the nature of historical knowledge and historical explanation, and of theories of the meaning of world history. (Martin)

PHIL 461 (157). THEORY OF MEANING. (3)
Prerequisites, PHIL 170 or 271, and 320. A study of theories about the meaning of linguistic expressions, including the verification theory and the theory of meaning as use. Among topics to be considered are naming, referring, synonymy, intension and extension, and ontological commitment. Such writers as Mill, Frege, Russell, Lewis, Carnap, Wittgenstein, Austin, and Quine will be discussed. (Kress, Odell)

PHIL 462 (171). THEORY OF KNOWLEDGE. (3)
Second semester. Prerequisites, PHIL 310 and 320. PHIL 271 recommended. The origin, nature, and validity of knowledge will be considered in terms of some philosophic problems about perceiving and thinking, knowledge and belief, thought and language, truth and confirmation. (Brown, Kress, Odell, Pasch)

PHIL 464 (170). METAPHYSICS. (3)
First semester. Prerequisites, PHIL 310 and 320. PHIL 271 recommended. A study of some central metaphysical concepts (such as substance, relation, causality, and time) and of the nature of metaphysical thinking.
(Pasch)

PHIL 466 (160). PHILOSOPHY OF MIND. (3)
Prerequisite, PHIL 320. An inquiry into the nature of mind through the analysis of such concepts as consciousness, perception, understanding, imagination, emotion, intension, and action. (Perkins)

PHIL 471 (155). SYMBOLIC LOGIC II. (3)
Prerequisite, PHIL 271 or consent of instructor. Axiomatic development of the propositional calculus and the first-order functional calculus, including the deduction theorem, independence of axioms, consistency, and completeness. (Svenonius)

PHIL 472 (175). TOPICS IN SYMBOLIC LOGIC. (3)
Prerequisite, PHIL 471. May be repeated for credit when the topics dealt with are different. (Svenonius)

PHIL 474 (176). INDUCTION AND PROBABILITY. (3)
Prerequisite, consent of instructor. A study of inferential forms, with emphasis on the logical structure underlying such inductive procedures as estimating and hypothesis-testing. Decision-theoretic rules relating to induction will be considered, as well as classic theories of probability and induction. (Staff)

PHIL 498, 499 (193, 194). TOPICAL INVESTIGATIONS. (1-3)

FOR GRADUATES

See *Graduate School catalog* for descriptions.

PHIL 688 (292). SELECTED PROBLEMS IN PHILOSOPHY. (1-3)

PHIL 799 (399). MASTER'S THESIS RESEARCH. (Arranged)

PHIL 808 (256). SEMINAR IN THE PROBLEMS OF PHILOSOPHY. (3)
PHIL 828 (255). SEMINAR IN THE HISTORY OF PHILOSOPHY. (3)
PHIL 838 (261). SEMINAR IN ESTHETICS. (3)
PHIL 848 (260). SEMINAR IN ETHICS. (3)
PHIL 868 (270). SEMINAR IN METAPHYSICS. (3)
PHIL 869 (271). SEMINAR IN THEORY OF KNOWLEDGE. (3)
PHIL 899 (499). DOCTORAL DISSERTATION RESEARCH. (Arranged)

PHYSICAL SCIENCES

PURPOSE OF PROGRAM

This program is suggested for many types of students: those whose interests cover a wide range of the physical sciences; those whose interests have not yet centered on any one science in particular; students interested in a career in an interdisciplinary area within the physical sciences, which include chemistry, physics, mathematics and computer science, astronomy, geology, and meteorology; pre-professional students (e.g., pre-law, pre-medical, pre-dental, etc.) who seek a broader undergraduate program than is possible in one of the traditional physical sciences; or students whose interests in business, urban problems, technical writing, advertising, or sales require a broader technical background than provided by a major in any one of the physical sciences. Students contemplating using this program as a basis for preparation for secondary school science teaching are advised to consult the Science Teaching Center staff of the College of Education for information concerning additional requirements for teacher certification.

The program requires a basic set of courses in physics, chemistry, and mathematics, which then permits the student to take a variety of courses in these and related disciplines, such as astronomy, geology, meteorology, and computer science. Emphasis is placed on a broad program as contrasted with a specialized one.

Students are advised by members of the Physical Science Committee. This committee is composed of faculty members from each of the represented disciplines and some student representatives. Assignment of advisor depends on the interest of the student, e.g., one interested principally in chemistry will be advised by the chemistry member of the committee. Students whose interests are too general to classify in this manner will normally be advised by the chairman of the committee.

The present composition of the Physical Science Committee is:

E. Smith—Astronomy, Chairman
A. Boyd—Dean's Office
R. Jaquith—Chemistry
P. DiLavore—Physics
D. Schneider—Mathematics
J. Vandergraft—Computer Science

A student representative also serves on this committee.

THE CURRICULUM

All students are required to take a set of basic courses that includes MATH 140, 141, 240, (12 credits); CHEM 103 and 104, or 105 and 106, (8 credits); PHYS 161, 262, 263, (11 credits); or 181, 182, 283, 284, (16 credits); or 221, 222 (10 credits); or PHYS 121, 122 followed by PHYS 262, or 271 (total 12 or 11 credits).

Beyond these basic courses the students must complete an additional 24 credits of which 12 must be at the 300-400 level, chosen from the following disciplines: chemistry, physics, mathematics, astronomy, geology, meteorology, and computer science. Students presenting the physics sequence through 284 as part of their basic curriculum may include four credits of PHYS 284 among these 24 credits. These 24 credits must be so distributed so that he has at least 6 credits in each of any *three* of the above listed disciplines. The University requirement of an average grade of at least C in the courses counting toward the major applies by including both the basic plus the broader set of courses.

Students who wish to depart from the stipulated curriculum may present their proposed program for approval by the Physical Science Committee acting as a whole.

Certain courses offered in these fields are not suitable for physical sciences majors and cannot count as part of the requirements of the program (e.g. ASTR 100, CMSC 100, PHYS 400, 401, CHEM 102, GEOL 431, 432, 460, 489), or courses corresponding to a lower level than the basic courses specified above (e.g. MATH 115).

PHYSICS AND ASTRONOMY

Professor and Chairman: Laster.

Assistant Professor and Assistant Chairman: Greene.

Professors: .Banerjee, Brill, Erickson, Ferrell, Glasser,[4] Glover, Greenberg, Griem, Holmgren, Hornyak, Kerr, Krall, Kundu, Levinson, MacDonald, Marion, Misner, Myers, Oneda, Prange, Pugh, Reiser,[3] Snow, Sucher, Trivelpiece, Wall, Weber, Westerhout, Yodh.

Professors, Part-Time: Brandt, Friedman, Hayward, McDonald, Musen, Opik, Rado, Slawsky.

Visiting Professors: Escobar, Fowler, Lawson.

Associate Professors: Alley, Bardasis, Beall, Bell, Bhagat, Currie, DeSilva, Dorfman,[1] Dragt, Earl, Falk, Fivel, Glick, Griffin, Kacser, Kehoe, H. G. Kim,[3] Y. S. Kim, Koch, Kunze, Matthews, Pati,

[1] Also Member of the Institute for Fluid Dynamics.
[3] Joint appointment with Chemical Engineering.

E. Smith, Steinberg, Stephenson, Wentzel, Woo, Zipoy, B. S. Zorn, G. T. Zorn.

Associate Professors, Part-Time: Bennett, Dixon, Johnson, Young[2].

Assistant Professors: A'Hearn, Anderson, Berg, Chang, Connors, Davidson, Drew, Gloeckler, Goldberg, Harrington, Korenman, Layman,[5] Martin, O'Gallagher, Pechacek, Poultney, Redish, Richard, Risk, Roos, Roush,[2] Simonson, Zapolsky, Zuckerman.

Assistant Professors, Part-Time: Larson.[3]

The Physics program includes a broad range of undergraduate courses designed to satisfy the needs of almost every student, from the advanced physics major to the person taking a single introductory physics course. In addition, there are various opportunities for personally directed studies between student and professor, and many undergraduate "research" opportunities also are available.

SERVICE COURSES—GENERAL EDUCATION REQUIREMENTS

The department offers several courses which are intended for students other than physics majors. Although other courses will also serve, PHYS 101 and PHYS 11, 112 are designed to fulfill the University-wide General Education requirement for non-laboratory physical science, and PHYS 117 satisfies the requirement for a physical science with laboratory. PHYS 121, 122 satisfy the requirements for professional schools, such as medical and dental, and PHYS 161, 262, 263 satisfy the introductory physics requirement for most engineering programs. In addition, PHYS 420 is a one semester modern physics course which is required in the electrical engineering program. Either the course-sequence 161, 262, 263, or the full sequence 181, 182, 283, 284 is suitable for mathematics students and those who major in other physical sciences.

THE PHYSICS MAJOR

The way most physics majors will begin their work is with a two-year basic sequence of physics courses, PHYS 181, 182, 283, 284, accompanied by the laboratory courses PHYS 285, 286 in the second year. Transfer students who come with a different set of introductory courses either will be put into an appropriate course in this sequence or will take bridging courses, such as PHYS 404, 405, and then go on to advanced courses; usually they will not repeat work previously done by taking the entire basic sequence.

The minimum requirement for a physics major is 38 semester hours of work in physics, including four laboratory courses and PHYS 410, 411, 421 and 422, and 19 semester hours of mathematics courses. After taking the basic sequence, the student will have some flexibility in his program, and he will be able to take specialty courses, such as those in nuclear physics or solid-state physics, which are of particular interest to him.

HONORS IN PHYSICS

The Honors Program offers to students of good ability and strong interest in physics a greater flexibility in their academic programs, and a stimulating atmosphere through contacts with other good students and with individual faculty members. There are opportunities for part-time research participation which may develop into full-time summer projects. An honors seminar is offered for advanced students; credit may be given for independent work or study, and certain graduate courses are open for credit toward the bachelor's degree.

Students are accepted by the department's Honors Committee on the basis of recommendations from their advisors and other faculty members, usually in the second semester of their junior year. A final written and oral comprehensive examination in the senior year is optional, but those who pass the examination will graduate "with honors in physics."

CHEMICAL PHYSICS

(See Molecular Physics)

PHYS 111 (001). ELEMENTS OF PHYSICS—MECHANICS, HEAT, AND SOUND. (3)
Three lectures a week. Prerequisite, successful passing of the qualifying examination in elementary mathematics. The first half of a survey course in general physics. This course is for the general student and does not satisfy the requirements, of the professional school. (Marion.)

PHYS 112 (002). ELEMENTS OF PHYSICS—MAGNETISM, ELECTRICITY, AND OPTICS. (3)
Three lectures a week. Prerequisite, PHYS 111. The second half of a survey course in general physics. This course is for the general student and does not satisfy the requirements of the professional schools. (Marion)

PHYS 117 (003). INTRODUCTION TO PHYSICS. (4)
Three lectures and one two-hour laboratory per week. Prerequisite, qualification to enter MATH 110. Intended for students majoring in neither the physical nor biological sciences. A study of the development of some of the basic ideas of physical science. (Connors)

PHYS 121, 122 (010, 011). FUNDAMENTALS OF PHYSICS. (4, 4)
Three lectures, one recitation, and one two-hour laboratory period a week. Prerequisite, entrance credit in trigonometry or MATH 111 or concurrent enrollment in MATH 115. A course in general physics treating the fields of mechanics, heat, sound, electricity, magnetism, optics, and modern physics. This course satisfies the minimum requirements of medical and dental schools. (Berg, Poultney, Snow)

PHYS 138 (050). INTERMEDIATE PHYSICS. (2)
First and second semesters. Two lectures a week. Prerequisite, PHYS 122.

[3] Joint appointment with Electrical Engineering.
[4] Joint appointment with Computer Science.
[5] Joint appointment with College of Education.

PHYS 161 (030). GENERAL PHYSICS—MECHANICS AND PARTICLE DYNAMICS. (3)
Three lectures and one recitation per week. MATH 141 to be taken concurrently. Laws of motion, force, and energy; principles of mechanics; collisions; rotation; and gravitation. (Goldberg, Smith)

PHYS 181, 182 (015, 016). INTRODUCTORY PHYSICS—MECHANICS, FLUIDS, HEAT, AND SOUND. (4, 4)
Three lectures and two demonstration periods a week. Prerequisites, a high school physics course and concurrent enrollment in MATH 115, 140 or consent of instructor. The first half of a broad, detailed introduction to physics, intended primarily for physics majors and other students with superior backgrounds in mathematics and the sciences. (Bhagat, Fivel, Pugh, Risk, Roos, Prange)

PHYS 221, 222 (025, 026). GENERAL PHYSICS FOR SCIENCE TEACHERS. (5, 5)
Three lectures and two two-hour labs per week. Prerequisites, high school physics or a non-calculus college physics survey course, and co-requisite: MATH 141. A course in physics stressing physical insight, for prospective secondary school science teachers. (Layman)

PHYS 262 (031). GENERAL PHYSICS—HEAT, WAVES AND RELATIVITY. (4)
Three lectures, one recitation and one three-hour laboratory period per week. Prerequisite, PHYS 161. Statistical physics; kinetic theory; wave motion; interference and refraction; special theory of relativity. (Drew, Korenman)

PHYS 263 (032). GENERAL PHYSICS—ELECTRICITY AND MAGNETISM. (4)
Three lectures, one recitation and one three-hour laboratory period per week. Prerequisite, PHYS 262. Electrostatics; electrodynamics; Maxwell's equation; quantum physics. (Drew, MacDonald)

PHYS 271 (104). INTERMEDIATE MECHANICS. (3)
Prerequisites, PHYS 121, 122; MATH 141 previously or concurrently. Three lecture-hours per week. Intended for students having completed PHYS 122 and wishing to enter the physical sciences major program. Not intended as a main-line course for physics majors. (Students offering transfer credit equivalence of PHYS 121, 122 who wish to become physics majors would start the sequence beginning with PHYS 181.) (Holmgren)

PHYS 283 (017). INTRODUCTORY PHYSICS—ELECTRICITY AND MAGNETISM. (4)
Three lectures and two demonstration periods a week. Prerequisites, PHYS 181, 182, pre- or corequisites, PHYS 285, and MATH 141. The third quarter of a broad, detailed introduction to physics; intended primarily for physics majors and other students with superior backgrounds in mathematics and the sciences. (Redish, Bardasis, Yodh)

PHYS 284 (018). INTRODUCTORY PHYSICS—OPTICS AND MODERN PHYSICS. (4)
Second semester. Three lectures and two demonstration periods a week. Prerequisites, PHYS 283 and previous or concurrent enrollment in PHYS 285 and MATH 240, or consent of instructor. The last quarter of a broad, detailed introduction to physics, intended primarily for physics majors and other students with superior backgrounds in mathematics and the sciences. (Glick, Falk)

PHYS 285, 286 (060, 061). INTERMEDIATE PHYSICS EXPERIMENTS. (2, 2)
Four hours of laboratory work per week. Prerequisite, concurrent enrollment in PHYS 283 or PHYS 284. Selected experiments. (Steinberg, Richard)

PHYS 305 (111). PHYSICS SHOP TECHNIQUES. (1)
One three-hour laboratory per week. Prerequisite, PHYS 365 or consent of instructor. Machine tools, design and construction of laboratory equipment. (Horn)

PHYS 321 (105). INTERMEDIATE ELECTRICITY AND MAGNETISM. (3)
Prerequisite: PHYS 121, 122; MATH 240 previously or concurrently; PHYS 271 or permission of the instructor. Electrostatics, direct current and alternating current circuitry, electromagnetic effects of steady currents, electromagnetic induction, development of Maxwell's equations. (Holmgren)

PHYS 365 (100). ADVANCED EXPERIMENTS. (2)
Four hours of laboratory work per week. Prerequisite, PHYS 284 and 286 or 263. Selected fundamental experiments in electricity and magnetism, elementary electronics, and optics. (Roush)

PHYS 399 (110). SPECIAL PROBLEMS IN PHYSICS. (1-3)
Two hours laboratory work a week for each credit hour. One to three credits may be taken concurrently each semester. (Will be given with sufficient demand.) Prerequisite, PHYS 365 and consent of advisor. Selected advanced experiments. (Staff)

PHYS 400, 401 (130, 131). BASIC CONCEPTS OF PHYSICS. (2, 2)
First and second semesters. Prerequisite, junior standing. A primarily descriptive course intended mainly for those students in the liberal arts who have not had any other course in physics. This course does not serve as a prerequisite or substitute for other physics courses. The main emphasis is on the concepts of physics, their evolution and their relation to other branches of human endeavor. (Gutsche, De Silva)

PHYS 404 (106). INTERMEDIATE THEORETICAL MECHANICS. (3)
Prerequisite, PHYS 271 and 321, or PHYS 284 or PHYS 263; MATH 241 previously or concurrently. Fundamentals and selected advanced topics of physical mechanics. Vector differential calculus will be used. For students starting physics without calculus, this course serves as part of the series of PHYS 271, 321, 404, 405, to provide terminal courses in general physics for physical science majors. (Myers)

PHYS 405 (107). INTERMEDIATE THEORETICAL ELECTRICITY AND MAGNETISM. (3)
Prerequisite, PHYS 284 or 321 or 263; MATH 241. After MATH 241 this course may be taken concurrently with PHYS 404. Intermediate electricity and magnetism and electromagnetic waves (optics). Vector differential calculus is used throughout. (B.S. Zorn)

PHYS 406 (102). OPTICS. (3)
Second semester. Three lectures a week. Prerequisites, PHYS 122 or 263 and MATH 240. Geometrical optics, optical instruments, wave motion, interference and diffraction, and other phenomena in physical optics. (Kunze)

PHYS 407 ((054). SOUND. (3)
(Will be given only with sufficient demand.) Three lectures a week. Prerequisite, PHYS 122 or 263; MATH 240 is to be taken concurrently. (Myers)

PHYS 410 (127). ELEMENTS OF THEORETICAL PHYSICS—MECHANICS. (4)
Prerequisites, PHYS 284, or PHYS 263, or PHYS 404 and PHYS 405; also MATH 241; or consent of instructor. A study of the theoretical foundations of mechanics, with extensive application of the methods. Also various mathematical tools of theoretical physics. (Y.S. Kim, Sucher)

PHYS 411 (128). ELEMENTS OF THEORETICAL PHYSICS—ELECTRICITY AND MAGNETISM. (4)
Prerequisite, PHYS 410 or consent of instructor. A study of the foundations of electromagnetic theory, with extensive application of the methods. Thorough treatment of wave properties of solutions of Maxwell's Equations. (Woo, Sucher)

PHYS 412 (126). KINETIC THEORY OF GASES. (3)
Three lectures a week. Prerequisites: PHYS 404 or 284 and MATH 240. Dynamics of gas particles, Maxwell-Boltzmann distribution, diffusion, Brownian motion, etc. (Munn)

PHYS 413 (144). ADVANCED THEORETICAL PHYSICS. (3)
Prerequisite, PHYS 410, 411. This course is an elective continuation of and supplement to PHYS 410, 411. A survey of advanced mathematical methods used in theoretical physics, particularly in the fields of classical mechanics, electromagnetism, relativity, and quantum mechanics. (Kacser)

PHYS 414 (152). INTRODUCTION TO THERMODYNAMICS AND STATISTICAL MECHANICS. (3)
Three lectures a week. Prerequisites, MATH 240, PHYS 284 or 404 or consent of the instructor. Introduction of basic concepts in thermodynamics and statistical mechanics. (Dorfman)

PHYS 420 (153). MODERN PHYSICS FOR ENGINEERS. (3)
Each semester. Three lectures per week. Prerequisites, PHYS 263 or 284 or 404 and 405; MATH 241 or consent of instructor. A survey of atomic and nuclear phenomena and the main trends in modern physics. This course is appropriate for students in engineering and other physical sciences. It should not be taken in addition to PHYS 421. (Chang, Gloeckler, Pechacek)

PHYS 421 (118). INTRODUCTION TO MODERN PHYSICS. (3)
Three lectures a week. Prerequisites, PHYS 181, 182, 283, 284 or equivalent; MATH 241 including some knowledge of ordinary differential equations. Introductory discussion of special relativity, origin of quantum theory, Bohr atom, wave mechanics, atomic structure, and optical spectra. (Alley)

PHYS 422 (119). MODERN PHYSICS. (3)
Three lectures a week. Prerequisite, PHYS 421. This course uses the basic ideas of quantum mechanics and special relativity to discuss the characteristics of many diverse subjects including complex atoms, molecules, solids, nuclei and elementary particles. (Myers)

PHYS 423 (145). ELEMENTARY QUANTUM PHYSICS. (3)
Prerequisites, PHYS 420 or PHYS 421; MATH 246; and a level of mathematical sophistication equivalent to that of a student who has taken PHYS 410 and PHYS 411, or ENEE 380 and ENEE 382. The quantum theory is presented in a rigorous way including the concepts of operators, measurement and angular momentum. These concepts together with the Schroedinger Equation are then applied to some basic problems in atomic and molecular physics. (Kacser)

PHYS 429 (140, 141). ATOMIC AND NUCLEAR PHYSICS LABORATORY. (3)
One lecture and four hours of laboratory a week. Prerequisites, two credits of PHYS 365 and consent of instructor. Classical experiments in atomic physics and more sophisticated experiments in current techniques in nuclear physics. Enrollment is limited to ten students. (G.T. Zorn)

PHYS 431 (122). PROPERTIES OF MATTER. (3)
Each semester. Three lectures a week. Prerequisite, PHYS 404 and 405 or 410, 421 or 420. Introduction to solid state physics. Electro-magnetic, thermal, and elastic properties of metals, semiconductors and insulators. (Anderson)

PHYS 441 (120). NUCLEAR PHYSICS. (3)
Four lectures a week. Prerequisite, PHYS 404 and 405 or 410, 421 or 420. An introduction to nuclear physics at the pre-quantum-mechanics level. Properties of nuclei; radioactivity; nuclear systematics; nuclear moments; the shell model, interaction of charged particles and gamma rays with matter; nuclear detector; accelerators: nuclear reactions; beta decay; high energy phenomena. (Hornyak)

PHYS 443 (121). NEUTRON REACTOR PHYSICS. (3)
Prerequisite, PHYS 371 or 421 or consent of instructor. Various related topics in neutron reactor physics.

PHYS 451 (129) INTRODUCTION TO ELEMENTARY PARTICLES. (3)
Three lectures per week. Prerequisite, PHYS 422 or consent of instructor. Properties of elementary particles, production and detection of particles, relativistic kinematics, invariance principles and conservation laws. (Risk)

PHYS 461 (117). INTRODUCTION TO FLUID DYNAMICS. (3)
Three lectures a week. Prerequisites, PHYS 404 and MATH 240. Kinematics of fluid flow, properties of incompressible fluids, complex variable methods of analysis, wave motions. (Koopman)

PHYS 463 (124). INTRODUCTION TO PLASMA PHYSICS. (3)
Three lectures per week. Prerequisite, PHYS 404 and 405 or 410, 421 or 420. Orbit theory, magnetohydrodynamics, plasma heating and stability, waves and transport processes. (Griem)

PHYS 471 (123). INTRODUCTION TO ATMOSPHERIC AND SPACE PHYSICS. (3)
Second semester. Three lectures a week. Prerequisite, PHYS 404 and 405 or 410, 421 or 420. Motions of charged particles in magnetic fields, aspects of plasma physics related to cosmic rays and radiation belts, atomic phenomena in the atmosphere, thermodynamics and dynamics of the atmosphere. (Earl)

PHYS 485 (109). ELECTRONIC CIRCUITS. (4)
Second semester. Three hours of lecture and two of laboratory per week. Prerequisite, PHYS 365 and concurrent enrollment in PHYS 405 or PHYS 411. Theory of semi-conductor and vacuum tube circuits. Application in experimental physics. (O'Gallagher)

PHYS 487 (186). PARTICLE ACCELERATORS, PHYSICAL AND ENGINEERING PRINCIPLES. (3)
Three hours of lecture per week. Prerequisites, PHYS 410, 411 or PHYS 271, 321 and PHYS 421, or equivalents. Sources of charged particles, methods of acceleration and focusing of electron and ion beams in electromagnetic fields; electrostatic accelerators; constant-gradient cyclotrons and synchrotrons; betatrons and microtrons; the alternating-gradient and sector-focusing principles; isochronous cyclotrons and alternating-gradient synchrotrons: linear accelerators. (H. Kim, Reiser)

PHYS 498 (190). INDEPENDENT STUDIES SEMINAR. (Cr. Arr.)
Credit according to work done. Each semester. Enrollment is limited to students admitted to the Independent Studies Program in physics. (Staff)

PHYS 499 (150). SPECIAL PROBLEMS IN PHYSICS. (Cr. Arr.)
Prerequisite, major in physics and consent of advisor. Research or special study. Credit according to work done. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

Of the courses which follow, 601, 602, 604, 606, 621, 622, 623, 624, and 625, 731, and 832 are given every year; all others will be given when there is sufficient demand.

PHYS 601 (200). THEORETICAL DYNAMICS. (3)

PHYS 602 (201). STATISTICAL PHYSICS. (3)

PHYS 604 (204). METHODS OF MATHEMATICAL PHYSICS. (3)

PHYS 606 (205). ELECTRODYNAMICS. (4)

PHYS 621 (209). GRADUATE LABORATORY. (3)

PHYS 622 (212). INTRODUCTION TO QUANTUM MECHANICS. (4)

PHYS 623 (213). INTRODUCTION TO QUANTUM MECHANICS. (3)

PHYS 624 (254). ADVANCED QUANTUM MECHANICS. (3)

PHYS 686 (290). CHARGED PARTICLE DYNAMICS, ELECTRON AND ION BEAMS. (3)

PHYS 703 (208). THERMODYNAMICS. (3)

PHYS 704 (210). STATISTICAL MECHANICS. (3)

PHYS 708 (230). SEMINAR IN TEACHING COLLEGE PHYSICS. (1)

PHYS 709 (230). SEMINAR IN GENERAL PHYSICS. (1)

PHYS 711 (228). SYMMETRY PROBLEMS IN PHYSICS. (3)

PHYS 718, 719 (230). SEMINARS IN GENERAL PHYSICS. (1, 1)

PHYS 721 (214). THEORY OF ATOMIC SPECTRA. (3)

PHYS 722 (215). THEORY OF MOLECULAR SPECTRA. (3)

PHYS 723 (216). MOLECULAR PHYSICS. (2)

PHYS 724 (217). MOLECULAR PHYSICS. (2)

PHYS 728 (230). SEMINAR IN ATOMIC AND MOLECULAR PHYSICS. (1)

PHYS 729 (230). SEMINAR IN GENERAL QUANTUM MECHANICS AND QUANTUM ELECTRONICS. (1)

PHYS 731 (244). SOLID STATE PHYSICS. (3)

PHYS 738 (230). SEMINAR IN EXPERIMENTAL SOLID STATE PHYSICS. (1)

PHYS 739 (230). SEMINAR IN THEORETICAL SOLID STATE PHYSICS. (1)

PHYS 741 (252). NUCLEAR STRUCTURE PHYSICS. (3)

PHYS 742 (253). NUCLEAR STRUCTURE PHYSICS. (3)

PHYS 748 (230). SEMINAR IN EXPERIMENTAL NUCLEAR PHYSICS. (1)

PHYS 749 (230). SEMINAR IN THEORETICAL NUCLEAR PHYSICS. (1)

PHYS 751 (260). HIGH ENERGY PHYSICS. (3)

PHYS 752 (239). ELEMENTARY PARTICLES. (3)

PHYS 758 (230). SEMINAR IN ELEMENTARY PARTICLES AND QUANTUM FIELD THEORY. (1)

PHYS 759 (230). SEMINAR IN ELEMENTARY PARTICLES AND QUANTUM FIELD THEORY. (1)

PHYS 761 (206). PLASMA PHYSICS. (3)

PHYS 762 (207). PLASMA PHYSICS. (3)

PHYS 768 (232, 233). SEMINAR IN FLUID DYNAMICS. (1)

PHYS 769 (230). SEMINAR IN PLASMA PHYSICS. (1)

PHYS 771 (221). COSMIC RAY PHYSICS. (3)

PHYS 778 (230). SEMINAR IN SPACE AND COSMIC RAY PHYSICS. (1)

PHYS 779 (230). SEMINAR IN GENERAL RELATIVITY. (1)

PHYS 788 (231). SEMINAR IN APPLIED PHYSICS. (1)

PHYS 789 (230). SEMINAR IN INTERDISCIPLINARY PROBLEMS. (1)

PHYS 798 (250). SPECIAL PROBLEMS IN ADVANCED PHYSICS. (1-3)

PHYS 799 (399). MASTERS THESIS RESEARCH. (Cr. Arr.)

PHYS 808 (248, 249). SPECIAL TOPICS IN GENERAL PHYSICS. (1-4)

PHYS 809 (248, 249). SPECIAL TOPICS IN GENERAL PHYSICS. (1-4)

PHYS 818 (248, 249). SPECIAL TOPICS IN GENERAL PHYSICS. (1-4)

PHYS 819 (248, 249). SPECIAL TOPICS IN GENERAL PHYSICS. (1-4)

PHYS 828 (248, 249). SPECIAL TOPICS IN ATOMIC AND MOLECULAR PHYSICS. (1-4)

PHYS 829 (248, 249). SPECIAL TOPICS IN GENERAL QUANTUM MECHANICS AND QUANTUM ELECTRONICS. (1-4)

PHYS 832 (242). THEORY OF SOLIDS. (3)

PHYS 833 (243). THEORY OF SOLIDS. (3)

PHYS 838 (248, 249). SPECIAL TOPICS IN EXPERIMENTAL SOLID STATE PHYSICS. (1-4)

PHYS 839 (248, 249). SPECIAL TOPICS IN THEORETICAL SOLID STATE PHYSICS. (1-4)

PHYS 843 (234). THEORETICAL NUCLEAR PHYSICS. (3)

PHYS 844 (235). THEORETICAL NUCLEAR PHYSICS. (3)

PHYS 848 (248, 249). SPECIAL TOPICS IN EXPERIMENTAL NUCLEAR PHYSICS. (1-4)

PHYS 849 (248, 249). SPECIAL TOPICS IN THEORETICAL NUCLEAR PHYSICS. (1-4)

PHYS 851 (255). ADVANCED QUANTUM MECHANICS. (3)

PHYS 852 (257). THEORETICAL METHODS IN ELEMENTARY PARTICLES. (3)

PHYS 853 (258). QUANTUM FIELD THEORY. (3)

PHYS 858 (248, 249). SPECIAL TOPICS IN ELEMENTARY PARTICLES AND QUANTUM FIELD THEORY. (1-4)

PHYS 859 (248, 249). SPECIAL TOPICS IN ELEMENTARY PARTICLES AND QUANTUM FIELD THEORY. (1-4)

PHYS 868 (248, 249). SPECIAL TOPICS IN FLUID DYNAMICS. (1-4)

PHYS 869 (248, 249). SPECIAL TOPICS IN PLASMA PHYSICS. (1-4)

PHYS 875 (236). THEORY OF RELATIVITY. (3)

PHYS 878 (248, 249). SPECIAL TOPICS IN SPACE AND COSMIC RAY PHYSICS. (1-4)

PHYS 879 (248, 249). SPECIAL TOPICS IN GENERAL RELATIVITY. (1-4)

PHYS 888 (245). SPECIAL TOPICS IN APPLIED PHYSICS. (2)

PHYS 889 (248, 249). SPECIAL TOPICS IN INTERDISCIPLINARY PROBLEMS. (1-4)

PHYS 899 (499). DOCTORAL THESIS RESEARCH. (Cr. Arr.)

(For Astronomy curriculum, see ASTRONOMY.)

PORTUGUESE

(See listings under SPANISH AND PORTUGUESE LANGUAGES AND LITERATURES.)

PRE-PROFESSIONAL CURRICULA

Within the College of Arts and Sciences there are a number of programs developed to prepare the pre-professional student. These curricula, some rather general and others quite specific, are designed to give the student the best background to succeed in his advanced training, to fill undergraduate requirements of professional schools, and to fit in with the requirements established by the organizations associated with the respective professions.

Pre-professional programs require that the student maintain a grade point average higher than the minimum for graduation. The student may fulfill requirements by majoring in almost any discipline in the College, provided the specific requirements of the pre-professional program are met. The successful completion of the pre-professional program does not guarantee admission to professional school. Each school has its own admissions requirements and criteria, generally based upon the grade point average in the undergraduate courses, the scores in aptitude tests

(Medical College Admission Test, Law Admission Test, or Dental Aptitude Test), a personal interview, and letters sent by the Evaluation Committee of the college. For the specific admissions requirements, the student is urged to study the catalog of the professional school of his choice.

Although completion of the bachelor's degree is a normal prerequisite for admission, three professional schools of the University of Maryland in Baltimore—Dentistry, Law, and Medicine—have arrangements whereby a student who meets requirements detailed below may be accepted for professional school after three years (90 academic hours). For the students to be eligible for the "combined degree," the final thirty hours prior to entry into the Schools of Dentistry, Law, and Medicine must be taken in residence in the College of Arts and Sciences. (A combined degree program in law is also available in the College of Business and Public Administration: for details see BPA program.) After the successful completion of thirty hours of work in professional school, the student may be eligible for a bachelor's degree from the College of Arts and Sciences (Arts-Dentistry, Arts-Law, or Arts-Medicine).

PRE-DENTISTRY

The pre-dental program is based upon requirements established by the Council of Dental Education of the American Dental Association, and the requirements for a degree from the College of Arts and Sciences following either the regular four-year program or the combined "Arts-Dentistry" program. The program is designed to prepare the student for the Dental Aptitude Test, normally taken in the spring of the junior year.

The minimum requirements for entry into dental school for either the three-year program (90 academic hours) or the four-year program (120 academic hours) are:

General Education requirements		34 hours
College requirements		
Foreign Language	0-12	
Speech	2	14 hours
plus		
Major		variable
Supporting courses (or "minor")		variable
Dental Association requirements		
Chemistry—organic	8	
inorganic	8	
Zoology	8	
Mathematics	4-6	
Physics	8	36-38 hours

Electives—to complete the 90 or 120 hours required.
Required Health and Physical Education.

Four-Year Program. A student applies to dental school in his senior year, on the basis of completing the usual degree requirements for the B.A. or B.S. degree from the College of Arts and Sciences, by majoring in the field of his choice and including in his course work the courses specifically prescribed by dental schools.

Three-Year Arts-Dentistry Program. Students whose performance during the first two years in residence at College Park is exceptional may be encouraged to seek admission to the University of Maryland Dental School at the end of their third year (90 academic hours). No undergraduate major is required for this program: the work of the first year of dental school is considered as the major; but students will select a minor (supporting courses) from one of the following combinations: zoology, six hours on the 300-400 level; microbiology, eight hours on the 300-400 level; CHEM 219 or 321 plus three hours on the 300-400 level in any science; CHEM 461, 462, 463, and 464; or nine hours on the 300-400 level in any one department of the arts, humanities, or social sciences.

Students accepted in the combined Arts-Dentistry program may receive the B.S. degree (Arts-Dentistry) after satisfactory completion of the first year at the University of Maryland Dental School (30 hours) upon recommendation by the Dean of the Dental School and approval by the College of Arts and Sciences. The degree is awarded in August following the first year of dental school.

Schedule. The pre-dental student, regardless of degree sought, includes in his first-year schedule CHEM 103, 104 or 105, 106, ZOOL 101, 102, MATH 110, 111 or (115), 116, ENGL 101, and the required health and physical education. The second year includes CHEM 201-204 or 211-214, the third year PHYS 121, 122. The schedules are completed with general education requirements, college requirements, major department requirements and electives. It is urged that the second year also include ZOOL 290 (a requirement of the University of Maryland Dental School) and 246. A course in statistics (such as PSYC 200 or SOCY 201) is required by the University of Maryland Dental School.

PRE-LAW

Although some law schools will consider only applicants with a B.A. or B.S. degree, others will accept applicants who have successfully completed a three-year program of academic work. Most law schools do not prescribe specific courses which a student must present for admission, but do require that the student follow one of the standard programs offered by the undergraduate college. Many law schools require that the applicant take the Law Admissions Test in the academic year preceding his entry into professional school.

Four-Year Program. The student who plans to complete the requirements for the B.A. or B.S. degree before entering law school should select a major field of concentration. The pre-law student ordinarily follows a Bachelor of Arts program with a major in American studies, English, American and English history, economics, political science (government and politics), psychology, sociology, or speech; a few pre-law students follow a bachelor of science program.

Three-Year Arts-Law Program. The student who plans to enter law school at the end of his third year should follow the general B.A. program during his first two years. During his junior year, he will complete the requirements for a minor (18 semester hours) in one of the fields of concentration. His program during the first three years should include all of the basic courses required for a degree from the College of Arts and Sciences (including the 18-hour minor) and all College and University requirements. The academic courses must total 90 hours, and must be passed with a minimum average of 2.0.

Students with exceptional records who are accepted to the School of Law of the University of Maryland under the Arts-Law program may receive a B.A. degree (Arts-Law) after satisfactory completion of the first year of law school, upon recommendation by the Dean of the Law School and approval by the College of Arts and Sciences. The degree is awarded in August following the first year of law school (or after 30 credit hours are completed).

PRE-MEDICINE

The pre-medical program is based upon the requirements established by the Association of American Medical Colleges, and the requirements for a degree from the College of Arts and Sciences, either with the four-year degree program or with the combined Arts-Medicine program. The curriculum is designed to prepare the student for the Medical College Admission Test, which is normally taken in the spring of the junior year.

The minimum requirements for entry into medical school for either the three-year program (90 academic hours) or the four-year program (120 academic hours) are:

General Education requirements		34 hours
College requirements		
Foreign Language	0-12	
Speech	2	14 hours
plus		
Major		variable
Supporting courses (or "minor")		variable
Medical School requirements		
Chemistry—general inorganic	8	
organic	8	
quantitative**	4	
Zoology (In addition to ZOOL 101 and 102, two of genetics, embryology, comparative anatomy)	16	
Mathematics	4-6	
Physics	8	48-50 hours

Electives—to complete the 90 or 120 hours required.
Required Health and Physical Education.

**Recommended but not required by the University of Maryland Medical School, required by some other medical schools.

Four-Year Program. No specific major is required for favorable consideration by a medical school admissions committee. By intelligent planning starting in the sophomore year, the student can meet the above requirements as well as requirements of most majors in the College of Arts and Sciences. The student is urged to work closely with his pre-medical advisor for this planning. A student who enters the pre-medical program late in his college career may find an additional year of study necessary (either as a special student or as a regular undergraduate).

Three-Year Arts-Medicine Program. After completion of his first year of pre-medical study an exceptional student may be encouraged to seek admission to the University of Maryland School of Medicine at the end of his third year (90 hours). During his next two years he will need to complete all requirements listed above, with the exception of the major and the regular minor. Four additional hours on the 300-400 level in appropriate science courses will satisfy the minor requirement.

Students accepted in the combined Arts-Medicine program may receive the B.S. degree (Arts-Medicine) after satisfactory completion of the first year at the University of Maryland School of Medicine (30 hours), upon recommendation by the Dean of the School of Medicine and approval by the College of Arts and Sciences. The degree is awarded in August following the first year of medical school.

Schedule. The pre-medical student normally includes in his first year schedule CHEM 103, 104 or 105, 106, ZOOL 101, 102, MATH 110, 111 or (115,) 116, ENGL 101 and the required health and physical education. The second year should include CHEM 201-204 or 211-214 and ZOOL 290, 246, the third year PHYS 121, 122. CHEM 219 (or 321) would also be taken in the third year in the case of a three-year applicant. The schedules are completed with general education requirements, college requirements, major department requirements and electives.

RELATED PROFESSIONS

Academic preparation for several professions related to dentistry or medicine is available through the College of Arts and Sciences. For requirements of professional schools in dental hygiene, optometry, osteopathy, etc., see catalogs of the specialized schools; representative catalogs are available in the office of the dean.

Medical Technology. The program in medical technology is administered by the School of Nursing.

Veterinary Medicine. The pre-veterinary program is administered by the College of Agriculture.

Dental Hygiene. The program in dental hygiene is administered by the School of Dentistry.

PSYCHOLOGY

Professor and Chairman: Bartlett.

Professors: Anderson, Crites, Gollub, Hodos, Horton, Levinson, Martin, Taylor, Tyler, Waldrop.

Associate Professors: Fretz, Goldstein, Locke, McIntire, Schneider, Scholnick, Steinman, Teitelbaum, Ward.

Assistant Professors: Carroll, Claiborn, Dachler, Dies, Evans, Hegge, Holmgren, Johnson, Larkin, Osterhouse, Smith, Specter, Sternheim.

Lecturer: Meenes.

Instructor: Horton.

Psychology can be classified as a biological science (Bachelor of Science degree) and a social science (Bachelor of Arts degree) and offers academic programs related to both of these fields. The undergraduate curriculum in psychology provides an organized study of the behavior of man and other organisms in terms of the biological conditions and social factors which influence such behavior. In addition, the undergraduate program is arranged to provide opportunities for learning that will equip qualified students to pursue further study of psychology and related fields in graduate and professional schools.

Students who are interested in the biological aspects of behavior tend to choose a program leading to the Bachelor of Science degree, while those interested primarily in the social factors of behavior. In addition, the undergraduate program the Bachelor of Arts degree. The choice of program is made in consultation with, and requires the approval of, an academic advisor.

Departmental requirements are the same for the Bachelor of Science and the Bachelor of Arts degrees. A minimum of 25 hours of psychology course-work is required; courses taken must include PSYC 101, 200, one of 400, 410, or 420, and an additional 12 hours of 400 level courses (not including 478 and 479). In addition to the above courses in psychology, all majors are required to take: (1) MATH 111 or 140; (2) one course, to be approved by an academic advisor in psychology, above the introductory level in one of the following fields; chemistry, computer science, mathematics, microbiology, physics, zoology. These two courses may be used as part of the General Education or college requirements in mathematics and science or for the supporting course requirements described below, but not for both. Majors in psychology are urged to take their mathematics and science courses in their first two years.

The supporting courses to supplement the work in the major for the Bachelor of Science degree must include 18 hours in mathematics and science, beyond those courses required by the college. A minimum of two courses must be laboratory courses, and at least three courses (or 9 hours) must be chosen at the advanced level (beyond the introductory sequence). The particular laboratory and advanced courses must be approved by an academic advisor in the Department of Psychology.

The supporting courses for the Bachelor of Arts degree must include 18 hours which are chosen in related fields to supplement work in the major. Of these 18 hours, six must be chosen at the 300 and 400 level. This set of courses must be approved by an academic advisor in psychology.

A student must obtain a C or better in PSYC 100 in order to major in psychology. A psychology major must have a 2.0 in his major courses and a 2.0 in his supporting courses in order to be certified for graduation with a degree in psychology. In addition, no student who ever receives a second grade lower than a C in PSYC 100, 200, or any 300-400 level psychology course will be certified for graduation in psychology.

Students desiring to enter graduate study in certain areas of psychology are advised to take an additional laboratory course and or participate in individual research projects. Such students should consult and advisor for information about prerequisites for graduate study in psychology.

HONORS

The Department of Psychology also offers a special program for the superior student which emphasizes independent study and research. Students may be eligible to enter the Honors Program who have a 3.3 grade average in all courses or the equivalent, who are in their junior year, and who demonstrate interest and maturity indicative of success in the program. Students in their sophomore year should consult their advisor or the Departmental Honors Committee for further information.

PSYC 100 (001). INTRODUCTION TO PSYCHOLOGY. (3)
A basic introductory course, intended to bring the student into contact with the major problems confronting psychology and the more important attempts at their solution. (Staff)

PSYC 100H (001H). INTRODUCTION TO PSYCHOLOGY (Honors). (3)

PSYC 200 (090). STATISTICAL METHODS IN PSYCHOLOGY. (3)
Prerequisite. PSYC 100 and MATH 110, 115, or equivalent. A basic introduction to quantitative methods used in psychological research. (Staff)

PSYC 201H (020H). INTERMEDIATE PSYCHOLOGY. (Honors) (3)
Second semester. Usually taken during sophomore year. Prerequisite, PSYC 100H or permission of instructor. The course content will stress the interrelations among data derived from the fields of human development, cognition, perception, measurement and social processes.

PSYC 206 (026). DEVELOPMENTAL PSYCHOLOGY. (3)
First semester. Prerequisite, PSYC 100. Biological basis of behavioral development in relation to genetic, constitutional, anatomical, physiological, and environmental factors. Emphasis upon both phylogenetic and ontogenetic research findings in biological psychology. (Brady, Hodos)

PSYC 221 (021). SOCIAL PSYCHOLOGY. (3)
Prerequisite, PSYC 100. Personality and behavior as influenced by culture and interpersonal relations. Social influences on motivation, learning, memory, and perception. Attitudes, public opinion, propaganda, language and communication, leadership, ethnic differences, and group process. (Staff)

PSYC 235 (005). PERSONALITY AND ADJUSTMENT. (3)
Prerequisite, PSYC 100. Introduction to psychology of human personality and adjustment. This course is designed for the student who desires a general knowledge of this area of psychology. This course may not be taken concurrently with or following PSYC 432. (Staff)

PSYC 236 (025). CHILD PSYCHOLOGY. (3)
Prerequisite, PSYC 100. Behavioral analysis of normal development and normal socialization of the growing child. This course may not be taken concurrently with or following PSYC 433. (Staff)

PSYC 301 (101). BIOLOGICAL BASIS OF BEHAVIOR. (3)
Prerequisites, PSYC 200, or 8 hours of zoology, or consent of instructor. This course is intended primarily for science majors or psychology majors not planning to take PSYC 400. May not be taken concurrently with or after PSYC 400. Surveys the experimental analysis of the behavior of humans and animals from the point of view of the biological mechanisms of behavior. Considers such topics as genetic determiners and physiological mechanisms, and basic principles of conditioning and learning. (Staff)

PSYC 365 (035). SURVEY OF INDUSTRIAL PSYCHOLOGY. (3)
Prerequisite, PSYC 100. A course for nonmajors which provides a general survey of the field of industrial psychology, including such topics as selection, training, job satisfaction, social organization, and environmental factors. This course may not be taken concurrently with or following PSYC 461.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Graduate credits will be assigned for students certified by the Department of Psychology as qualified for graduate standing.

PSYC 400 (146). EXPERIMENTAL PSYCHOLOGY: LEARNING AND MOTIVATION. (4)
Two lectures and four one-hour laboratory periods per week. Prerequisite, PSYC 200 or equivalent. Students who have taken PSYC 301 need consent of instructor. Primarily for students who major in psychology. The experimental analysis of behavior with emphasis on conditioning, learning and motivational processes. Experiments are conducted on the behavior of animals. (Staff)

PSYC 402 (180). PHYSIOLOGICAL PSYCHOLOGY. (3)
Prerequisite, PSYC 410 or consent of instructor. An introduction to research on the physiological basis of human behavior, including considerations of sensory phenomena, motor coordination, emotion, drives, and the neurological basis of learning. (Staff)

PSYC 403 (181). ANIMAL BEHAVIOR. (3)
Prerequisite, PSYC 400 or consent of instructor. A study of animal behavior, including considerations of social interactions, learning, sensory processes, motivation, and experimental methods, with a major emphasis on mammals. (McIntire)

PSYC 410 (145). EXPERIMENTAL PSYCHOLOGY: SENSORY PROCESSES I. (4)
Three lectures and one two-hour laboratory/demonstration period per week. Prerequisite, PSYC 200 or equivalent. Primarily for students who major in psychology. A systematic survey of the content, models, and methodologies of sensory and perceptual research. (Staff)

PSYC 412 (182). EXPERIMENTAL PSYCHOLOGY: SENSORY PROCESSES II. (4)
Two lectures and four hours of laboratory exercise and research per week. Prerequisite, PSYC 410 or consent of instructor. Primarily for psychology majors and majors in biological sciences with a special interest in sensory processes. Lectures and laboratory exercises will emphasize contemporary problems in sensory process research. Sufficient latitude will be provided so the exceptional student may conduct original research based on findings reported in the current literature.

PSYC 420 (147). EXPERIMENTAL PSYCHOLOGY: SOCIAL BEHAVIOR. (4)
Two lectures and two two-hour laboratory periods per week. Prerequisite, PSYC 221 and PSYC 200 or equivalent. A laboratory course dealing with methods of studying behavior in the social context. Topics will include social perception and motivation, small groups, communication and persuasion. Consideration will be given to the techniques involved in laboratory experimentation, field studies, attitude scale construction, and opinion surveys. (McGinnies, Higgs, Ward)

PSYC 422 (123). LANGUAGE AND SOCIAL COMMUNICATION. (3)
Second semester. Prerequisite, PSYC 221 and PSYC 200 or equivalent, and consent of instructor. The nature and significance of verbal and nonverbal communication in social psychological processes including examination of relevant theoretical approaches to symbolic behavior. (Staff)

PSYC 423 (183). ADVANCED SOCIAL PSYCHOLOGY. (3)
Prerequisite, PSYC 420. A systematic review of researches and points of view in regard to major problems in the field of social psychology.

PSYC 431 (131). ABNORMAL PSYCHOLOGY. (3)
Prerequisite, PSYC 100 and 200 or equivalent. The nature, diagnosis, etiology, and treatment of mental disorders. (Staff)

PSYC 432 (105). PERSONALITY. (3)
Prerequisite, PSYC 200 or equivalent. Major personality theories, their postulates and evidence; assessment and research methodology in personality; major areas of personality research, their methodologies, findings, implications, and relationships to the field of psychology. (Staff)

PSYC 433 (125). ADVANCED TOPICS IN CHILD PSYCHOLOGY. (3)
Prerequisite, PSYC 200 or equivalent. The growth and transformation of basic psychological processes from birth to maturity. Emphasis is on research data and methodological issues, especially as they relate to other aspects of psychology. (Staff)

PSYC 441 (148). PSYCHOLOGY OF HUMAN LEARNING. (3)
Prerequisite, PSYC 200 or equivalent. Review and analysis of the major phenomena and theories of human learning, including an introduction to the fields of problem solving, thinking and reasoning. (Staff)

PSYC 451 (150). PRINCIPLES OF PSYCHOLOGICAL TESTING. (4)
Three lectures and one two-hour laboratory period per week. Prerequisite, PSYC 200 or equivalent. A survey of the basic concepts and theories of psychological measurement illustrated through demonstration of principal approaches to psychological testing. (Staff)

PSYC 452 (151). PSYCHOLOGY OF INDIVIDUAL DIFFERENCES. (3)
Prerequisite, PSYC 451. Problems theories, and researches related to psychological differences among individuals and groups. (Waldrop, Johnson)

PSYC 453 (152). MATHEMATICAL PSYCHOLOGY. (3)
Prerequisite, PSYC 200 or equivalent, and consent of instructor. A survey of mathematical formulations in psychology, including measurement and scaling models, statistical and psychometric models, and elementary mathematical representations of psychological processes in learning, choice, psychophysics, and social behavior. (Staff)

PSYC 461 (135). PERSONNEL AND INDUSTRIAL PSYCHOLOGY. (3)
Prerequisite, PSYC 200 or equivalent. An intensive study of the main areas of industrial psychology with emphasis on primary source material. This course emphasizes research methodology and the relationship of research findings to general theoretical issues. (Staff)

PSYC 462 (136). ENGINEERING PSYCHOLOGY. (3)
Prerequisite, PSYC 200 or equivalent. An examination of the characteristics of the man-machine system with primary emphasis on human performance. Some of the topics covered are: information processing, decision making, training, environmental constraints, and automation. (Staff)

PSYC 478 (194). INDEPENDENT STUDY IN PSYCHOLOGY. (1-3)
Prerequisite, written consent of instructor. A student who wishes to take independent work must have completed 12 hours of psychology with at least a 2.5 average. Integrated reading under direction leading to the preparation of an adequately documented report on a special topic. (In special cases a student who may need to repeat this course in order to complete his independent study will make a formal request, including a research proposal, through his advisor to the Departmental Honors Committee.)

PSYC 479 (195). SPECIAL RESEARCH PROBLEMS IN PSYCHOLOGY. (1-3)
Prerequisite, written consent of instructor. A student who wishes to take independent research study must have completed 12 hours of psychology with at least a 2.5 average. An individual course designed to allow the student to pursue a specialized research topic under supervision. (In special cases a student who may need to repeat this course in order to complete his research will make a formal request, including a research proposal, through his advisor to the Departmental Honors Committee.)

PSYC 488H (196H). ADVANCED PSYCHOLOGY I (Honors). (3)
Second semester. Usually taken during junior year. Prerequisites, PSYC 200 and permission of Department Honors Committee. Seminar covering topics in sensation, perception, learning, and motivation.

PSYC 489 (191). SENIOR SEMINAR. (3)
Prerequisite, written consent of the individual instructor (may be repeated). The historical and theoretical roots of the subject matter areas of psychology. Different topical areas and the current theory and related research will be discussed.

PSYC 498H (197H). ADVANCED PSYCHOLOGY II (Honors). (3)
First semester. Usually taken during senior year. Prerequisite, PSYC 488H. Seminar covering topics in measurement, social processes and other subject matter of current interest.

PSYC 499H (199H). HONORS THESIS RESEARCH
First and second semester. Usually taken during last semester in residence. Prerequisite, permission of thesis advisor.

FOR GRADUATES

See *Graduate School catalog* for descriptions.
(All the following courses require consent of the instructor. Not all of the graduate courses are offered every year.)

PSYC 601, 602 (252, 253). ADVANCED STATISTICS. (3, 3)

PSYC 611 (265). ADVANCED DEVELOPMENTAL PSYCHOLOGY. (3)

PSYC 612 (267). THEORIES OF PERSONALITY. (3)

PSYC 641 (241). PERSUASION AND ATTITUDE CHANGE. (3)

PSYC 642 (243). SEMINAR IN SMALL GROUP BEHAVIOR. (3)

PSYC 648 (242). SEMINAR IN SOCIAL PSYCHOLOGY. (3)

PSYC 651, 661 (211, 212). ADVANCED GENERAL PSYCHOLOGY. (3, 3)

PSYC 671 (208). VERBAL BEHAVIOR. (3)

PSYC 687, 688 (205, 206). HISTORICAL VIEWPOINTS AND CURRENT THEORIES IN PSYCHOLOGY. (3, 3)

PSYC 701 (254). FACTOR ANALYSIS. (3)

PSYC 704 (256). MENTAL TEST THEORY. (3)

PSYC 706 (258). DEVELOPMENT OF PREDICTORS. (3)

PSYC 708 (255). SEMINAR IN PSYCHOMETRIC THEORY. (3)

PSYC 709 (257). SEMINAR IN QUANTITATIVE PSYCHOLOGY. (3)

PSYC 711 (221). SEMINAR IN COUNSELING PSYCHOLOGY. (3)

PSYC 713 (222). SEMINAR IN CLINICAL PSYCHOLOGY. (3)

PSYC 721, 723 (225, 226). BEHAVIORAL ASSESSMENT AND MEASUREMENT. (2, 2)

PSYC 722, 724 (227, 228). LABORATORY IN BEHAVIORAL ASSESSMENT AND MEASUREMENT. (2, 2)

PSYC 727, 729 (263, 264). MODIFICATION OF HUMAN BEHAVIOR: LABORATORY AND PRACTICUM. (3)

PSYC 730 (230). SEMINAR IN ENGINEERING PSYCHOLOGY. (3)

PSYC 731 (231). TRAINING PROCEDURES IN INDUSTRY. (3)

PSYC 732 (232). PERSONNEL SELECTION AND JOB ANALYSIS. (3)

PSYC 733 (233). SOCIAL ORGANIZATION IN INDUSTRY. (3)

PSYC 738 (229). SEMINAR IN INDUSTRIAL PSYCHOLOGY. (3)

PSYC 740 (240). INTERVIEW AND QUESTIONNAIRE TECHNIQUES. (3)

PSYC 761 (213). ADVANCED LABORATORY TECHNIQUES. (1-3)

PSYC 762 (214). COMPARATIVE PSYCHOLOGY. (3)

PSYC 763 (215). ADVANCED PSYCHOPHYSIOLOGY. (3)

PSYC 765 (216). SEMINAR IN PSYCHOPHARMACOLOGY. (3)

PSYC 768 (207). CONDITIONING AND LEARNING. (3)

PSYC 788, 789 (288, 289). SPECIAL RESEARCH PROBLEMS. (1-4, 1-4)

PSYC 798 (203). GRADUATE SEMINAR. (2)

PSYC 799 (399). THESIS RESEARCH. (Credit Arranged)

PSYC 800 (200). PRO-SEMINAR: PROFESSIONAL ASPECTS OF PSYCHOLOGICAL SCIENCE. (1)

PSYC 801 (220). PSYCHOLOGICAL CONCEPTS IN MENTAL HEALTH. (3)

PSYC 802 (223). SEMINAR IN COMMUNITY MENTAL HEALTH. (3)

PSYC 803 (224). SEMINAR IN STUDENT PERSONNEL. (2)

PSYC 804 (260). OCCUPATIONAL DEVELOPMENT AND CHOICE. (3)

PSYC 805, 806 (261, 262). MODIFICATION OF HUMAN BEHAVIOR: RESEARCH METHODS AND PRACTICES. (3, 3)

PSYC 807 (266). THEORIES OF MOTIVATION. (3)

PSYC 808 (269). PRACTICUM IN COMMUNITY MENTAL HEALTH CONSULTATION. (3)

PSYC 809 (270). ADVANCED ABNORMAL PSYCHOLOGY. (3)

PSYC 810 (271). APPRAISAL OF DISABILITIES. (3)

PSYC 811 (272). INDIVIDUAL CLINICAL DIAGNOSIS. (3)

PSYC 812 (274). EVALUATION AND CHANGE IN EDUCATIONAL SKILLS. (3)

PSYC 858 (201). SENSORY AND PERCEPTUAL PROCESSES. (3)

PSYC 888, 889 (285, 286). RESEARCH METHODS IN PSYCHOLOGY. (1-3, 1-3)

PSYC 898 (204). GRADUATE SEMINAR. (2)

PSYC 899 (499). DISSERTATION RESEARCH (Credit Arranged).

RUSSIAN

See listings under GERMANIC AND SLAVIC LANGUAGES AND LITERATURES.)

RUSSIAN AREA PROGRAM

Director: Yaney

This program is for the student who wants to concentrate his studies in the humanities and the social sciences on the Russian area. It includes work in language and literature, history, government and politics, economics, and geography. The student may emphasize any one of these disciplines in completing his courses. The program prepares the student for graduate work in the Russian area, but by proper selection of courses a student may concentrate his work sufficiently in one discipline to be able to take up graduate work in this particular field.

The student following this program must meet the general requirements for a degree in the College of Arts and Sciences. He should select Russian to meet the foreign language requirements.

Required introductory courses are: RUSS 101, 102, and 104 (unless the student is exempted from this requirement), HIST 241 and 242, GEOG 201 or 203, ECON 205 or 201, 203. These courses must be passed with at least an average grade of "C" in order for the student to continue in the program.

Advanced courses in the Russian area: the student must complete at least 30 hours of advanced work in the Russian area including 12 hours of advanced courses in Russian language, 6 hours in Russian history, 6 hours in Russian government, 3 hours in Soviet economics.

The student must complete an additional 18 hours of advance work in the above disciplines. Of these 18, at least 12 must all be in one of the departments and at the 300-400 level. If the student wishes to concentrate in Russian language and literature, he should take at least 15 of these hours in Russian.

Normally, the student's advisor will be a professor in the Russian area of the department in which he does most of his work.

SOCIOLOGY AND ANTHROPOLOGY

Professor and Chairman: Ellis.
Associate Professor and Vice Chairman: Hirzel.
Professor and Director of the Division of Criminology: Lejins.
Associate Professor and Director of the Division of Anthropology: Williams.
Professors: Dager, Ellis, Janes, Lejins.
Associate Professors: Anderson, Cussler, Henkel, McIntyre, Williams.
Assistant Professors: Bateman, Braungart, Coates, Federico, Fidelholtz, Franz, Harper, Hunt, Kruegel, Lengermann, Maida, Pease, Rosen, Schwartz, Simons, Thomas, Wellford.
Lecturers: Clymer, Cosnow, Pollitt, Thurman.

SOCIOLOGY

The major in sociology offers: (1) a liberal education especially directed toward understanding the complexities of modern society and its social problems; (2) a broad preparation for various types of professions, occupations and services dealing with people; (3) a more specific preparation in the areas in which the department offers specialization such as criminology and corrections, community studies, etc.; (4) preparation of qualified students for graduate training in sociology. A comprehensive set of courses in anthropology is provided by that division and a major is offered. Statements on course requirements and recommended courses in these areas are available in the departmental office.

A minimum of 30 hours in sociology is required of majors. Required courses include SOCY 100, SOCY 200, SOCY 201, SOCY 400, SOCY 402. Students interested in the honors program should check their eligibility with the Department's Honors Committee.

SOCY 100 (001) or its equivalent is prerequisite to all other courses in sociology.

SOCY 100 (001). INTRODUCTION TO SOCIOLOGY. (3)
This course is one of the set of courses within the social science requirement of the General Education Program. Sociological analysis of the American social structure; metropolitan, small town, and rural communities; population distribution, composition and change; social organization. (Staff)

SOCY 110 (013). RURAL SOCIOLOGY. (3)
Prerequisite, SOCY 100. Rural life in America; its people, social organization, culture patterns, and problems. (Staff)

SOCY 120 (014). URBAN SOCIOLOGY. (3)
Prerequisite, SOCY 100. Urban growth and expansion; characteristics of city populations; urban institutions and personality patterns; relations of city and country. (Staff)

SOCY 200 (086). PRINCIPLES OF SOCIOLOGY. (3)
Prerequisite, SOCY 100 and sophomore standing. The basic forms of social interaction, processes, and structures. Intended primarily for, and required of, all majors. It is recommended that the course be taken in the sophomore year. The basic forms of human associations and interactions, social processes; institutions, culture, human nature and personality.
(Lengermann, Pease, Schwartz, Staff)

SOCY 201 (095). INTRODUCTORY STATISTICS FOR SOCIOLOGY. (3)
(Two lectures and two hours drill per week). Prerequisites, SOCY 100 and MATH 110 or equivalent. Elementary descriptive and inferential statistics. Measures of central tendency and variation, non-parametric and parametric measures of association and correlation, one-way analysis of variance, hypothesis testing, point and interval estimates. Required of all sociology majors.
(Bateman, Henkel, Kruegel, Simons, Staff)

SOCY 210 (051). SOCIAL PROBLEMS. (3)
Prerequisites, SOCY 100 and sophomore standing. An examination of the nature of social problems; perspectives on social problems; the ways in which social problems are implicated in the organization of society; and a detailed study of selected social problems including social conflict and social inequality. (Staff)

SOCY 215 (062). SOCIAL INSTITUTIONS. (3)
Prerequisites, SOCY 100 and sophomore standing. Nature and function of social institutions; the perpetuation of behavior through customs and social norms; typical contemporary American institutions. (Staff)

SOCY 220 (052). CRIMINOLOGY. (3)
Prerequisites, SOCY 100 and sophomore standing. Criminal behavior and the methods of its study; causation; typologies of criminal acts and offenders; punishment, correction and incapacitation; prevention of crime.
(Lejins, Maida, Wellford, Staff)

SOCY 230 (071). DYNAMICS OF SOCIAL INTERACTION. (3)
Prerequisite, SOCY 100. Social psychology of groups such as committees, teams, clubs, sects, social movements, crowds and publics. Origin of the social self; role behavior, inter-group and intra-group relations.
(Cussler, Dager, Staff)

Junior and Senior Courses Not Acceptable For Credit Toward Graduate Degrees

SOCY 310 (131). INTRODUCTION TO SOCIAL SERVICE. (3)
Prerequisite, SOCY 100. General survey of the field of social welfare activities; historical development; growth, functions and specialization of agencies and services, private and public. (Federico)

SOCY 311 (174). SENIOR SEMINAR IN SOCIAL WORK. (3)
Prerequisites, SOCY 100 and permission of the instructor. Open only to graduating seniors enrolled in the Pre-Professional Social Work Program. This course seeks to give pre-professional social work students experience in applying social science theory to concrete social problems. Cases of psychological, social and biological malfunction will be studied, and specific treatment plans constructed. The interrelated nature of several causes of deviant behavior will be stressed, as will the importance of understanding and using the principles of several social science disciplines. (Federico)

SOCY 330 (118). COMMUNITY ORGANIZATION. (3)
Prerequisite, SOCY 100. Community organization and its relation to social welfare; analysis of community needs and resources; health, housing, recreation; community centers; neighborhood projects. (Federico)

SOCY 359 (191). SOCIAL FIELD TRAINING. (1-3)
Prerequisites, SOCY 100; and for social work field training, SOCY 310; for crime control field training, SOCY 220 and SOCY 450. Enrollment restricted to available placements. Supervised field training in public and private social agencies. The student will select his particular area of interest and be responsible to an agency for a definite program of in-service training. Group meetings, individual conferences and written program reports will be a required part of the course. (Staff)

SOCY 388H (194H). INDEPENDENT RESEARCH IN SOCIOLOGY. (3)
Prerequisite, SOCY 100. For honors students only. This course is designed for the needs of the honors students in sociology. (Staff)

SOCY 389H (193H). INDEPENDENT READING COURSE IN SOCIOLOGY. (3)
Prerequisite, SOCY 100. For honors students only. This course is designed for the needs of the honors students in sociology. (Staff)

SOCY 399 (199). INDEPENDENT STUDY OF SOCIOLOGY. (1-6)
Prerequisites, written consent of faculty under whose direction the study is to be performed, and at least 12 hours of sociology credit to include one or more of the following: SOCY 201; SOCY 400; SOCY 402. Integrated reading or research under direction and supervision of faculty member. (Staff)

Junior and Senior Courses Acceptable For Credit Toward Some Graduate Degrees

SOCY 400 (186). SOCIOLOGICAL THEORY. (3)
Prerequisite, SOCY 100. Development of the science of sociology; historic backgrounds; recent theories of society. Required of all sociology majors. Should be taken in senior year. (Janes, Hunt, Thomas)

SOCY 401 (195). INTERMEDIATE STATISTICS FOR SOCIOLOGISTS. (3)
Prerequisites, SOCY 201 or equivalent and six additional credits in sociology. Intermediate correlation techniques, analysis of variance, sampling, additional non-parametric techniques, additional topics in inferential statistics. Required of all candidates for the M.A. degree.
(Bateman, Henkel, Simons, Staff)

SOCY 402 (196). INTRODUCTION TO RESEARCH METHODS IN SOCIOLOGY. (3)
Prerequisite, SOCY 100. Nature and scope of sociological research problem formulation, case study methods, observational methods, survey method, experimental methods, documentary methods, miscellaneous methods. Required of all sociology majors.
(Bateman, Harper, Henkel, Kruegel, McIntyre, Staff)

SOCY 410 (121). POPULATION. (3)
Prerequisite, SOCY 100. Population distribution and growth in the United States and the world; population characteristics of the United States; resulting population problems and policies. (Hirzel, Kruegel)

SOCY 411 (122). POPULATION. (3)
Prerequisite, SOCY 100. Trends in fertility and mortality, migrations, population estimates, and the resulting problems and policies. (Hirzel, Kruegel)

SOCY 421 (102). INTERCULTURAL SOCIOLOGY. (3)
Prerequisite, SOCY 200. On the basis of a comparative study of customs, individual and group behavior patterns and institutions, this course studies the ideologies of America and other modern societies. (Franz)

SOCY 423 (123). ETHNIC MINORITIES. (3)
Prerequisite, SOCY 100. Basic social processes in the relations of ethnic groups within the state; immigration groups and the Negro in the United States; ethnic minorities in Europe. (Lejins, Staff)

SOCY 424 (124). SOCIOLOGY OF RACE RELATIONS. (3)
Prerequisite, SOCY 100. Race as a focus of social relations. Political and collective action centering on race relations. New myths of race. Trends in assimilation of racial groupings. (McIntyre, Schwartz)

SOCY 426 (136). SOCIOLOGY OF RELIGION. (3)
Prerequisite, SOCY 100. Varieties and sources of religious experience. Religious institutions and the role of religion in social life. (Thomas)

SOCY 427 (125). DEVIANT BEHAVIOR. (3)
Prerequisite, SOCY 100. Current theories of the genesis and distribution of deviant behavior. Definitions of deviance, labeling theory, secondary deviance. Theories of specific forms of deviant behavior will be examined for their implications for a general theory of deviant behavior. (Staff)

SOCY 430 (141). SOCIOLOGY OF PERSONALITY. (3)
Prerequisite, SOCY 100. Development of human nature and personality in contemporary social life; processes of socialization; attitudes, individual differences and social behavior. (Bateman, Cussler, Dager, Hunt, Simons)

SOCY 431 (143). FORMAL AND COMPLEX ORGANIZATIONS. (3)
Prerequisite, SOCY 100. The concept of formal organization. The study of functioning and control in the operation of bureaucracies such as corporations and in large-

scale organizations such as military, religious and educational hierarchies. Forms of recruitment, internal mobility and organizational personality. Relations between large-scale organizations and with the larger society. (Lengermann, Schwartz)

SOCY 432 (144). COLLECTIVE BEHAVIOR. (3)
Prerequisite, SOCY 100. Social interaction in mass behavior, communication processes; structure and functioning of crowds, strikes, audiences, mass movements, and the public. (Cussler, Simons)

SOCY 433 (145). SOCIAL CONTROL. (3)
Prerequisite, SOCY 100. Forms, mechanism, and techniques of group influence on human behavior; problems of social control in contemporary society. (Staff)

SOCY 441 (162). SOCIAL STRATIFICATION. (3)
Prerequisite, 9 credits of sociology. An introduction to the sociology of social stratification. Consideration of the basic concepts and major findings in the field. The relationship of social stratification to the institutional orders of the society. (Ellis, Pease)

SOCY 443 (164). THE FAMILY AND SOCIETY. (3)
Prerequisite, SOCY 100. Study of the family as a social institution; its biological and cultural foundations, historic development, changing structure, and function; the interactions of marriages and parenthood, disorganizing and reorganizing factors in present day trends. (Harper, McIntyre)

SOCY 445 (148). SOCIOLOGY OF THE ARTS. (3)
Prerequisite, SOCY 100. Functions of the arts as a social institution. Social role of the artist. Recruitment to and organizational structure of artistic professions. Art forms and social characteristics of audiences. Changing technology and social values as reflected in artistic expression. (Federico)

SOCY 447 (180). SMALL GROUP ANALYSIS. (3)
Prerequisite, SOCY 100. Analysis of small group structure and dynamics. Review of research on small groups in factories, military service, schools and communities. Presentation of techniques used in the study of small groups. (Franz)

SOCY 450 (153). JUVENILE DELINQUENCY. (3)
Prerequisite, SOCY 100. Juvenile delinquency in relation to the general problem of crime; analysis of factors underlying juvenile delinquency; treatment and prevention. (Lejins, Maida, Wellford, Staff)

SOCY 451 (154). CRIME AND DELINQUENCY PREVENTION. (3)
Prerequisite, SOCY 220 or SOCY 450 or consent of instructor. Methods and programs in prevention of crime and delinquency. (Lejins, Maida, Wellford, Staff)

SOCY 452 (155). TREATMENT OF CRIMINALS AND DELINQUENTS IN THE COMMUNITY. (3)
Prerequisite, SOCY 220 or SOCY 450 or consent of instructor. Analysis of the processes and methods in the modification of criminal patterns of behavior in a community setting. (Lejins, Maida, Wellford, Staff)

SOCY 453 (156). INSTITUTIONAL TREATMENT OF CRIMINALS AND DELINQUENTS. (3)
Prerequisite, SOCY 220 or SOCY 450 or consent of instructor. History, organization and functions of penal and correctional institutions for adults and juveniles. (Lejins, Maida, Wellford, Staff)

SOCY 457 (147). SOCIOLOGY OF LAW. (3)
Prerequisite, SOCY 100. Law as a form of social control; interrelation between legal and other conduct norms as to their content, sanctions, and methods of securing conformity; law as an integral part of the culture of the groups; factors and processes operative in the formation of legal norms as determinants of human behavior (Lejins)

SOCY 460 (111). SOCIOLOGY OF OCCUPATIONS AND CAREERS. (3)
Prerequisite, SOCY 100. The sociology of work and occupational life in modern society. Changing occupational ideologies, values and choices. Occupational status systems and occupational mobility. The social psychology of career success. (Coates, Lengermann)

SOCY 462 (115). INDUSTRIAL SOCIOLOGY. (3)
Prerequisite, SOCY 100. The sociology and human relations in American industry and business. Complex industrial and business organization as social systems. Social relationships within and between industry, business, community, and society. (Coates, Lengermann)

SOCY 464 (116). MILITARY SOCIOLOGY. (3)
Prerequisite, SOCY 100. Social change and the growth of military institutions. Complex formal military organizations. Military organizations as social systems. Military service as an occupation or profession. The sociology of military life. Relations between military institutions, civilian communities and society. (Coates)

SOCY 465 (117). THE SOCIOLOGY OF WAR. (3)
Prerequisite, SOCY 100. The origin and development of armed forces as institutions, the social causes, operations and results of war as social conflict; the relations of peace and war and revolution in contemporary civilizations. (Coates)

SOCY 466 (133). THE SOCIOLOGY OF POLITICS. (3)
Prerequisite, 9 credits of sociology. An introduction to the sociology of political phenomena. Consideration of the basic concepts and major findings in the field; the relationship of the polity to other institutional orders of the society; the relationship of political activity in America to the theory of democracy. (Braungart)

SOCY 470 (112). RURAL-URBAN RELATIONS. (3)
Prerequisite, SOCY 100. The ecology of population and the forces making for change in rural and urban life; migration, decentralization and regionalism as methods of studying individual and national issues. Applied field problems. (Henkel)

SOCY 471 (113). THE RURAL COMMUNITY. (3)
Prerequisite, SOCY 100. A detailed study of rural life with emphasis on levels of living, the family, school, and church and organizational activities in the fields of health, recreation, welfare, and planning. (Staff)

SOCY 473 (114). THE CITY. (3)
Prerequisite, SOCY 100. The rise of urban civilization and metropolitan regions; ecological process and structure; the city as a center of dominance; social problems, control and planning. (Hirzel, Janes, Pollitt)

FOR GRADUATES

SOCY 600 (282). SOCIOLOGY METHODOLOGY. (3)

SOCY 601 (295). ADVANCED STATISTICS FOR SOCIOLOGISTS. (3)

SOCY 602 (201). METHODS OF SOCIAL RESEARCH. (3)

SOCY 606 (217). SEMINAR IN FIELD WORK URBAN RESEARCH. (3)

SOCY 608 (202). ADVANCED RESEARCH METHODS IN SOCIOLOGY. (3)

SOCY 609 (204). PRACTICUM IN DATA ANALYSIS IN FIELD RESEARCH. (3)

SOCY 618 (205). COMPUTER METHODS FOR SOCIOLOGISTS. (3)

SOCY 620 (286). DEVELOPMENT OF EUROPEAN AND AMERICAN SOCIOLOGICAL THEORY. (3)

SOCY 621 (287). SEMINAR: SOCIOLOGICAL THEORY. (3)

SOCY 622 (288). THE SOCIOLOGY OF KNOWLEDGE. (3)

SOCY 623 (214). SURVEY OF URBAN THEORY. (3)

SOCY 624 (271). THEORY OF SOCIAL INTERACTION. (3)

SOCY 625 (266). RESEARCH LITERATURE IN SOCIAL STRATIFICATION. (3)

SOCY 626 (219). HUMAN ECOLOGY. (3)

SOCY 630 (221). POPULATION AND SOCIETY. (3)

SOCY 631 (230). COMPARATIVE SOCIOLOGY. (3)

SOCY 632 (241). PERSONALITY AND SOCIAL STRUCTURE. (3)
SOCY 633 (216). SOCIOLOGY OF OCCUPATIONS AND PROFESSIONS. (3)
SOCY 634 (246). PUBLIC OPINION AND PROPAGANDA. (3)
SOCY 635 (247). SOCIOLOGY OF LAW. (3)
SOCY 636 (250). FORMAL ORGANIZATION. (3)
SOCY 640 (257). SOCIAL CHANGE AND SOCIAL POLICY. (3)
SOCY 641 (262). FAMILY STUDIES. (3)
SOCY 642 (264). THE SOCIOLOGY OF MENTAL HEALTH. (3)
SOCY 643 (215). COMMUNITY STUDIES. (3)
SOCY 650 (253). ADVANCED CRIMINOLOGY. (3)
SOCY 651 (254). SEMINAR: CRIMINOLOGY. (3)
SOCY 652 (255). SEMINAR: JUVENILE DELINQUENCY. (3)
SOCY 653 (256). CRIME AND DELINQUENCY AS A COMMUNITY PROBLEM. (3)
SOCY 699 (291). SPECIAL SOCIAL PROBLEMS. (Cr. Arr.)
SOCY 799 (399). MASTER'S THESIS RESEARCH. (Cr. Arr.)
SOCY 899 (499). DOCTORAL DISSERTATION RESEARCH. (Cr. Arr.)

For anthropology curriculum, see ANTHROPOLOGY.

SPANISH AND PORTUGUESE LANGUAGES AND LITERATURES

Professor and Chairman: Hesse.
Professors: Goodwyn, Gramberg, Marra-Lopez, Mendeloff, Nemes, Parsons, Rand (emerita).
Associate Professor: Rovner.
Assistant Professors: Flores, Natella, Norton, Sosnowski.
Lecturer: Rentz.
Instructors: Borroto, Crissman, Diz, Feustle, Miller, Raggio, Sendra, Villavicencio, Willoughby-Macdonald, Wooldridge.

MAJORS

Two types of undergraduate majors are offered in Spanish: one for the general student or the future teacher, and the other for those interested in a rounded study of a foreign area for the purpose of understanding another nation through its literature, history, sociology, economics, and other aspects. Both of these majors confer the B.A. degree. (The department also offers M.A. and Ph.D. degrees in language and literature, but not in area study.)

An undergraduate major in either language and literature or area studies requires a total of 39 hours with a C average, above the basic Arts and Sciences College foreign language requirement.

LANGUAGE AND LITERATURE MAJOR

Courses: SPAN 201, 221, 301-302; 311 or 312, 321-322 or 323-324; 401 or 402 plus five courses on the 400 level in literature (one of which may be elected outside of the field of literature) for a total of 39 hours.

Twelve hours of supporting courses, two of which must be on the 300 and 400 level in a single department other than the major and education. Suggested areas: government and politics, art, history, philosophy and comparative literature, etc., for a combined total of 51 hours.

FOREIGN AREA MAJOR

The area study major in Spanish endeavors to provide the student with the knowledge of the various aspects of Spain and Spanish America. Specific requirements in this major are SPAN 201, 301-302, 311-312, 321-322 or 323-324, 331-332 or 333-334, and four semester courses in Spanish literature numbered 408-498, for a total of 39 hours.

Twelve hours of supporting courses, six of which must be on the 300-400 level in a single department other than the major and education. Suggested areas: economics, government and politics, geography, history, philosophy, etc., for a combined total of 51 hours.

HONORS IN SPANISH

A student whose major is Spanish and who, at the time of application, has a general academic average of 3.0 to 3.5 in his major field may apply to the Chairman of the Honors Committee for admission to the Honors Program of the department. Honors work normally begins in the first semester of the junior year, but a qualified student may enter as early as the sophomore year or as late as the second semester of the junior year. Honors students are required to take two courses from those numbered 491, 492, 493 and the seminar numbered 496, as well as to meet other requirements for a major in Spanish. There will be a final comprehensive examination covering the honors reading list, which must be taken by all graduating seniors who are candidates for honors. Admission of students to the Honors Program, their continuance in the program, and the final award of honors are the prerogative of the Departmental Honors Committee.

ELEMENTARY HONORS

Courses 102H and 112H in Spanish are limited to specially approved candidates who have passed courses 101 or 111 with high grades, and will allow them to by-pass courses 104 and 114.

LOWER DIVISION COURSES

There are two tracks of elementary and intermediate courses in Spanish. Track I consists of three semesters of four credits each (101, 102, 104) and Track II of four semesters of three credits each (111, 112, 114, 115). The language requirement of the College of Arts and Sciences is satisfied by passing either 104 or 115 or equivalent.

Transfer students with college credit have the option of continuing at the level for which they are theoretically prepared or of taking a placement

examination, or of electing courses 103 or 113. If a transfer student takes course 103 or 113 for credit, he may retain transfer credit *only* for the equivalent of course 101 or 111. A transfer student placing lower than his training should warrant may ignore the placement but DOES SO AT HIS OWN RISK.

If a student has received a D in a course, advanced and completed the next higher course, he cannot go back and repeat the original "D".

NO CREDIT WILL BE GIVEN, EVEN ELECTIVE, FOR A SINGLE SEMESTER OF LANGUAGE 101 OR 111.

A student whose native language is taught at the University may not meet the college requirement by taking courses 101-104, 111-115, 314, and 312 in that language. There is a special option by which foreign students may offer a combination of FOLA 001 and 002 (English for Foreign Students) and 12 hours of other English courses to satisfy both the Arts and Sciences English and foreign language requirements. This option may not be used by pre-medical students.

The civilization courses (331-334) cannot be used toward the foreign language requirement except by students who *begin* language at the University with a fifth semester course (201) or higher.

SPANISH

SPAN 101 (new). ELEMENTARY SPANISH. (4)
Introduction to basic structures, with emphasis upon audio-lingual skills. Four recitations per week, and one optional laboratory hour. Normally leads to 102, but gifted students may be recommended for 102H.

SPAN 102 (new). ELEMENTARY SPANISH. (4)
Completion of basic structures, with increasing emphasis upon reading skill, reinforced by discussion and composition. Four recitations per week and one optional laboratory hour. Normally leads to 104, but gifted students may be recommended for 104H.

SPAN 102H (new). ELEMENTARY SPANISH HONORS. (4)
Limited to students who have been recommended by their instructor in 101. Enriced course of study, with broad reading base and related development of oral and written expression. Four recitations per week and one optional laboratory hour. Normally leads to 201 or 221 at student's option.

SPAN 103 (new). REVIEW OF ELEMENTARY SPANISH. (4)
Limited to students who have had at least two years of high school Spanish or the equivalent, and who do not qualify for 104. Four recitations per week and one optional laboratory hour. Normally leads to 104.

SPAN 104 (new). INTERMEDIATE SPANISH. (4)
Extensive reading, discussion and composition. Four recitations per week and one optional laboratory hour. Normally leads to 201 or 221 at student's option.

SPAN 104H (new). INTERMEDIATE SPANISH HONORS. (4)
Limited to students who have been recommended by their instructor in 102. Enriched course of study, with broad reading base and related development of oral and written expression. Four recitations per week and one optional laboratory hour. Normally leads to 321, 322, 323, or 324 at student's option.

SPAN 111, 112 (001, 002). ELEMENTARY SPANISH. (3, 3)
Each semester; given as intensive course in summer session. Three recitations and one laboratory hour per week. Study of linguistic structure and development of audio-lingual and writing ability. (Rentz, Staff)

SPAN 112H (003H). ELEMENTARY SPANISH, HONORS COURSE. (3)
Three recitations and one laboratory hour per week. Enrollment limited to specially approved candidates from SPAN 111. Students taking this course will normally continue in SPAN 115. (Rentz, Staff)

SPAN 113 (005). REVIEW OF ELEMENTARY SPANISH. (3)
Three recitations and one laboratory hour per week. Enrollment limited to students who, having taken the placement examination, have failed to qualify for SPAN 114. (Rentz, Staff)

SPAN 114, 115 (006, 007). INTERMEDIATE SPANISH. (3, 3)
Three recitations per week. Given as intensive course in summer session. Prerequisite, SPAN 112 or equivalent, or SPAN 113, except that recommended students may enter SPAN 115 from SPAN 112H. Study of linguistic structure, further development of audio-lingual and writing ability, and reading of literary texts with discussion in Spanish. Usually there will be an honors section for qualified students. (Staff)

SPAN 201 (012). REVIEW OF ORAL AND WRITTEN SPANISH. (3)
Prerequisite, SPAN 115. A practical language course recommended for all students continuing in Spanish. May be taken concurrently with SPAN 221. (Staff)

SPAN 211 (041). SPANISH PHONETICS. (3)
Prerequisite, SPAN 115 or equivalent. Descriptive study of the Spanish sound system. Practice in phonetic perception, transcription and articulation. Particular attention to sentence phonetics; juncture, rhythm, stress, pitch. (Mendeloff)

SPAN 221 (011). INTRODUCTION TO SPANISH LITERATURE. (3)
Prerequisite, SPAN 115. Required of all students who continue in advanced courses of department, with exception of superior students who are permitted to bypass an introduction to Spanish literature. Conducted in Spanish. Reading of literary texts, discussion and brief essays. (Staff)

SPAN 230, 231 (051, 052). COMMERCIAL SPANISH (3, 3)
Prerequisite, SPAN 201 and consent of instructor. Designed to give knowledge of correct Spanish usage, commercial letters and business forms. Fundamental principles of Spanish shorthand will be included if warranted by the interest and ability of the class. (Rovner)

SPAN 301, 302 (071, 072). REVIEW OF GRAMMAR AND COMPOSITION. (3, 3)
Prerequisite, SPAN 201 and 221 or equivalent. Intended to give an intensive and practical drill in Spanish composition. (Staff)

SPAN 311, 312 (080, 081). ADVANCED CONVERSATION. (3, 3)
Prerequisite, SPAN 201 or consent of instructor. For students who wish to develop fluency and confidence in speaking the language. (Staff)

SPAN 321, 322 (075, 076). SURVEY OF SPANISH LITERATURE. (3, 3)
Prerequisite, SPAN 221 or equivalent. Basic survey of the history of Spanish literature. (Staff)

SPAN 323, 324 (077, 078). SURVEY OF SPANISH-AMERICAN LITERATURE. (3, 3)
Prerequisite, SPAN 221 or equivalent. Basic survey of the history of Spanish-American literature. (Sosnowski)

SPAN 331, 332 (171, 172). SPANISH CIVILIZATION. (3, 3)
A survey of two thousand years of Spanish history, outlining the cultural heritage of the Spanish people, their great men, traditions, customs, art, and literature, with special emphasis on the interrelationship of social and literary history. (Staff)

SPAN 333, 334 (173, 174). LATIN AMERICAN CIVILIZATION. (3, 3)
The cultural heritage of the Latin American people. Pre-Columbian civilization. Hispanic and other European influences. (Nemes, Sosnowski)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

SPAN 401, 402 (103, 104). ADVANCED COMPOSITION. (3, 3)
Free composition, literary translation and practical study of syntactical structure. (Staff)

SPAN 408, 409 (105, 106). GREAT THEMES OF THE HISPANIC LITERATURES. (3, 3)
Pervading themes in the literature of Spain or Spanish-America. Each theme will be announced when the course is offered. (Nemes, Staff)

SPAN 410, 411 (107, 108). LITERATURE OF THE MIDDLE AGES. (3, 3)
Spanish literary history from the eleventh through the fifteenth century. Reading of representative texts. First semester: to 1350. Second semester: from 1350 to 1500. (Mendeloff)

SPAN 412 (109). THE ROMANCERO. (3)
Origin, nature and influence. Extensive reading in each of the respective sub-genres. (Mendeloff)

SPAN 420, 421 (111, 112). PROSE AND POETRY OF THE SIXTEENTH CENTURY. (3, 3)
Selected readings and literary analysis. (Goodwyn, Staff)

SPAN 424 (113). DRAMA OF THE SIXTEENTH CENTURY. (3)
From the earliest *autos* and *pasos*, the development of Spanish drama anterior to Lope de Vega, including Cervantes. (Rovner)

SPAN 430, 431 (115, 116). CERVANTES: NOVELAS EJEMPLARES AND DON QUIXOTE. (3, 3) (Goodwyn)

SPAN 434, 435 (117, 118). PROSE AND POETRY OF THE SEVENTEENTH CENTURY. (3, 3)
Selected readings, literary analysis, and discussion of the outstanding prose and poetry of the period, in the light of the historical background. (Goodwyn)

SPAN 436, 437 (119, 120). DRAMA OF THE SEVENTEENTH CENTURY. (3, 3)
First semester devoted to Lope de Vega, dramatic theory and the Spanish stage. Second semester: drama after Lope de Vega to Calderon de la Barca and the decline of the Spanish theater. (Rovner)

SPAN 440, 441 (125, 126). LITERATURE OF THE EIGHTEENTH CENTURY. (3, 3)
Traditionalism, neo-Classicism, and pre-Romanticism in prose, poetry, and the theater; esthetics and poetics of the Enlightenment. (Rovner)

SPAN 452 (130). THE ROMANTIC MOVEMENT IN SPAIN. (3)
Poetry, prose and drama of the Romantic and post-Romantic periods. (Gramberg)

SPAN 454 (131). NINETEENTH CENTURY FICTION. (3)
Significant novels of the nineteenth century. (Gramberg)

SPAN 456 (132). NINETEENTH CENTURY DRAMA AND POETRY. (3)
Significant dramas and poetry of the Realistic period. (Gramberg)

SPAN 460, 461 (141, 142). THE GENERATION OF 1898 AND ITS SUCCESSORS. (3, 3)
Authors and works of all genres of the generation of 1898 and those of the immediately succeeding generation. (Marra-Lopez)

SPAN 462 (136). TWENTIETH CENTURY DRAMA. (3)
Significant plays of the twentieth century. (Marra-Lopez)

SPAN 464 (144). CONTEMPORARY SPANISH POETRY. (3)
Spanish poetry from the generation of 1927 to the present. (Marra-Lopez)

SPAN 466 (143). THE CONTEMPORARY SPANISH NOVEL. (3)
The novel and the short story from 1940 to the present. (Marra-Lopez)

SPAN 468, 469 (133, 134). MODERNISM AND POST-MODERNISM IN SPAIN AND SPANISH-AMERICA. (3, 3)
A study of the most important works and authors of both movements in Spain and Spanish-America. (Nemes)

SPAN 470 (101). APPLIED LINGUISTICS. (3)
Nature of applied linguistics and its contribution to the effective teaching of foreign languages. Comparative study of English and Spanish with emphasis upon points of divergence. Analysis, evaluation and construction of related drills. (Mendeloff)

SPAN 480, 481 (163, 164). SPANISH-AMERICAN ESSAY. (3, 3)
A study of the socio-political contents and aesthetic qualities of representative works from the Colonial to the Contemporary period, with emphasis on the essay of the twentieth century in the second semester. (Nemes, Sosnowski)

SPAN 488, 489 (159, 160). SPANISH-AMERICAN FICTION. (3, 3)
Representative novels and/or short stories from the Wars of Independence to the present or close analysis of major contemporary works. Subject will be announced each time course is offered. (Nemes, Staff)

SPAN 491H, 492H, 493H, (195H, 196H, 197H). HONORS READING COURSES. (3, 3, 3)
Supervised reading to be taken normally only by students admitted to the Honors Program: 491 is poetry, 492 is the novel, 493 is the drama. (Natella)

SPAN 496H (199H). HONORS SEMINAR. (3)
Required of all students in the Honors Program. Other students will be admitted on special recommendation. Conducted in Spanish. Discussion of a central theme with related investigation by students. (Natella)

SPAN 498 (162). SPANISH-AMERICAN POETRY. (3)
Main trends, authors and works from the Conquest to Rubén Darío. (Nemes, Natella)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

SPAN 600, 601 (281, 282). READING COURSE FOR MINORS IN SPANISH LITERATURE. (3, 3) (Staff)

SPAN 602, 603 (283, 284). READING COURSE FOR MINORS IN SPANISH-AMERICAN LITERATURE. (3, 3) (Nemes)

SPAN 605 (297). TEACHING SPANISH IN INSTITUTIONS OF HIGHER LEARNING. (3) (Hesse, Flores)

SPAN 608, 609 (207, 208). MEDIEVAL SPANISH LITERATURE. (3) (Mendeloff)

SPAN 610 (201). THE HISTORY OF THE SPANISH LANGUAGE. (3) (Mendeloff)

SPAN 612 (203). COMPARATIVE ROMANCE LINGUISTICS. (3) (Mendeloff)

SPAN 618, 619 (211, 212). POETRY OF THE GOLDEN AGE. (3, 3) (Goodwyn, Hesse)

SPAN 628, 629 (215, 216). SEMINAR: THE GOLDEN AGE IN SPANISH LITERATURE. (3, 3) (Hesse)

SPAN 708, 709 (225, 226). THE EIGHTEENTH CENTURY. (3, 3) (Staff)

SPAN 718, 719 (233, 234). THE NINETEENTH CENTURY. (3, 3) (Gramberg)

SPAN 728, 729 (241, 242). THE TWENTIETH CENTURY. (3, 3) (Marra-Lopez)

SPAN 738 (245). THE DRAMA OF THE TWENTIETH CENTURY. (3) (Marra-Lopez)

SPAN 798 (291). OPEN SEMINAR. (3)
Topic to be determined. (Staff)

SPAN 799 (399). THESIS RESEARCH. (1-6) (Staff)

SPAN 808, 809 (263, 264). COLONIAL SPANISH-AMERICAN LITERATURE. (3, 3) (Nemes)

SPAN 818, 819 (265, 266). NATIONAL SPANISH-AMERICAN LITERATURE. (3, 3) (Nemes)

SPAN 828, 829 (237, 238). HISPANIC POETRY OF THE NINETEENTH AND TWENTIETH CENTURIES. (3, 3) (Nemes)

SPAN 898 (292). OPEN SEMINAR. (3)
Topic to be determined. (Staff)

SPAN 899 (499). DISSERTATION RESEARCH (ARRANGED). (Staff)

PORTUGUESE

PORT 101 (new). ELEMENTARY PORTUGUESE. (4)
Introduction to basic structures, with emphasis upon audio-lingual skills. Four recitations per week and one optional laboratory hour. Leads to 102.

PORT 102 (new). ELEMENTARY PORTUGUESE. (4)
Completion of basic structures with increasing emphasis upon reading skill, reinforced by discussion and composition. Four recitations per week and one optional laboratory hour.

PORT 104 (new). INTERMEDIATE PORTUGUESE. (4)
Extensive reading, discussion and composition. Four recitations per week and one optional laboratory hour.

SPEECH AND DRAMATIC ART

Professor and Chairman: Aylward.
Professors: Newby, Pugliese, Strausbaugh.
Associate Professors: Baker, Farquhar, Linkow, Meersman, Niemeyer.
Research Professor: Causey.
Research Associate Professor: Spuehler.
Assistant Professors: Abrams, Bankson, Canetta, Doudna, Green, Kennicott, Kirkley, LeDuc, O'Leary, Provensen, Rebach, Starcher, Vaughan, Weiss, Wolvin, Zelenka.
Assistant Research Professors: Nabelek, Elkins.
Instructors: Blum, Boss, Buenger, Caudill, Corea, DuMonceau, Elliott, Geoffrey, Hard, Harris, Jones, Lea, McCleary, McClure, McKerrow, Mosbo, Rosenthal, Slattum.
Research Associates: Revoile, Wintercorn.

The departmental curricula lead to the Bachelor of Arts degree and permit the student to develop a program with emphasis in one of the four areas of the department: (1) Speech communication (rhetoric, public address, communication theory, oral interpretation, organizational, and interpersonal communication, (2) Dramatic art (educational theater, acting, directing, producing, theater history, and technical theater), (3) Radio-television-film (broadcasting, programming, directing, broadcast law and regulation, international broadcasting, film production, and contemporary cinema), (4) Speech and hearing science (phonetics, speech and hearing therapy, speech pathology, and audiology). In cooperation with the College of Education, the department provides an opportunity for teacher certification in the speech education program.

The curriculum is designed to provide: (1) a liberal education through special study of the arts and sciences of human communication, (2) preparation for numerous opportunities in business, government, media and related industries, and education.

Since communication is a dynamic field, the course offerings are under constant review and development, and the interested student should obtain specific information about a possible program from a departmental advisor.

The major requirements are: 30 hours of course work in any of the divisions exclusive of those courses taken to satisfy General Education or college requirements. Of the 30 hours, at least 15 must be upper division, in the 300 or 400 series. No course with a grade less than C may be used to satisfy major requirements.

Each of the possible concentrations in the department requires certain courses in order to provide a firm foundation for the work in that area. Specific information about these course requirements and course options for the supporting (minor) program should be obtained from an advisor in the particular area.

The department offers numerous specialized opportunities for those interested through co-curricular activities in theater, film, television, and forensics. For the superior student an Honors Program is available, and interested students should consult their advisor for further information no later than the beginning of their junior year.

SPEECH COMMUNICATION

SPCH 100 (001). PUBLIC SPEAKING. (3)
Prerequisite for advanced speech courses. The preparation and delivery of short original speeches; outside readings; reports, etc. It is recommended that this course be taken during the freshman year. SPCH 100 and 107 may not both be used for credit. (Linkow, Staff)

SPCH 107 (007). PUBLIC SPEAKING. (2)
The preparation and delivery of speeches on technical and general subjects. SPCH 107 and 100 may not both be used for credit. (Kennicott, Staff)

SPCH 110 (004). VOICE AND DICTION. (3)
Emphasis upon the improvement of voice, articulation, and phonation. May be taken concurrently with SPCH 100. (Starcher, Staff)

SPCH 200 (002). ADVANCED PUBLIC SPEAKING. (3)
Prerequisite, SPCH 100 or 107. A study of rhetorical principles and models of speech composition in conjunction with the preparation and presentation of specific forms of public address. (Wolvin, Staff)

SPCH 220 (010). GROUP DISCUSSION. (3)
A study of the principles, methods and types of discussion, and their application in the discussion of contemporary problems. (Abrams, Staff)

SPCH 230 (011). DEBATE. (3)
Pre-law students may take SPCH 230, 330 instead of SPCH 100 or SPCH 107. A study of the principles of argument, analysis, evidence, reasoning, fallacies, briefing, and delivery, together with their application in public speaking. (Staff)

PSCH 240 (013). ORAL INTERPETATION. (3)
The oral interpretation of literature and the practical training of students in the art of reading. (Provenson, Staff)

SPCH 325 (023). PARLIAMENTARY LAW. (1)
A study of the principles and application of parliamentary law as applied to all types of meetings. Thorough training in the use of Robert's Rules of Order. (Strausbaugh)

SPCH 330 (012). DEBATE. (3)
Pre-law students may take SPCH 230, 330 instead of SPCH 100 or SPCH 107. A study of the principles of argument, analysis, evidence, reasoning, fallacies, briefing, and delivery, together with their application in public speaking. (Staff)

SPCH 350 (021). FUNDAMENTALS OF SPEECH COMMUNICATION. (3)
A study of oral communicative behavior, including prob-

lems and processes of symbolizations, aspects of oral language, the involvement of the talker and listener, kinds of signals, and self-revelation through speech. (Rebach, Staff)

SPCH 420 (110). ADVANCED GROUP DISCUSSION. (3)
Prerequisite, SPCH 220. Required in speech curriculum and elective in other curricula. An examination of current research and techniques in the discussion and conference, including extensive practice in this area. (Linkow)

SPCH 423 (133). COMMUNICATION PROCESSES IN CONFERENCES. (3)
Prerequisite, one course in public speaking. Limited to students at the off-campus centers. Group participation in conferences, methods of problem solving, semantic aspects of language, and the function of conferences in industry and government. (Linkow)

SPCH 440 (107). ADVANCED ORAL INTERPRETATION. (3)
Prerequisite, SPCH 240. Emphasis upon the longer reading. Program planning. (Provensen)

SPCH 450 (161). ANCIENT RHETORIC. (3)
Prerequisite, SPCH 200 or consent of instructor. The theories of speech-making and speech composition as propounded by the classical rhetoricians. Special attention is given to Plato, Aristotle, Socrates, Cicero, Quintillian, and St. Augustine. (Wolvin)

SPCH 451 (162). MODERN RHETORIC. (3)
Prerequisite, SPCH 200 or consent of the instructor. A study of the development of modern rhetorical theories in Europe and America with consideration of the application of the theories to public address. Special attention is given to Thomas Sheridan, John Walker, George Campbell, Hugh Blair, Richard Whately, James A. Winans, Charles Woolbert, I. A. Richards, and Kenneth Burke. (Wolvin)

SPCH 460, 461 (124, 125). AMERICAN PUBLIC ADDRESS. (3, 3)
Prerequisite, SPCH 100 or 107. The first semester covers the period from colonial times to the Civil War period. The second semester covers from the Civil War period through the contemporary period. (Kennicott)

SPCH 470 (163). MATERIALS AND PROGRAMS FOR THE DEVELOPMENT OF LISTENING. (3)
The study of research finding, listening tests, materials, equipment, and programs which can be used to develop listening skills. (Wolvin)

SPCH 475 (164). PERSUASION IN SPEECH. (3)
Prerequisite, SPCH 200 or 230. A study of the bases of persuasion with emphasis on recent experimental developments in persuasion. (Kennicott)

SPCH 498 (111). SEMINAR. (3)
Prerequisites, senior standing and consent of instructor. Present-day speech research. (Strausbaugh, Staff)

SPCH 499 (180). HONORS SEMINAR. (3)
For Honors students only. Readings, symposiums, visiting lecturers, discussions. (Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

SPCH 600 (261). INTRODUCTION TO GRADUATE STUDY IN SPEECH COMMUNICATION. (3)

SPCH 680 (260). SPEECH AND DRAMA PROGRAMS IN HIGHER EDUCATION. (3)

SPCH 698 (262). SPECIAL PROBLEMS IN GENERAL SPEECH. (3)

SPCH 755 (263). RHETORICAL THEORIES OF STYLE. (3)

SPCH 776 (264). INTERPERSONAL COMMUNICATION. (3)

SPCH 798 (290). INDEPENDENT STUDY. (1-3)

SPCH 799 (399). THESIS RESEARCH. (Cr. Arr.)

DRAMATIC ART

DART 110 (016). INTRODUCTION TO THE THEATRE. (3)
A general survey of the fields of the theatre. (Pugliese)

DART 120 (008). ACTING. (3)
Prerequisite, consent of instructor. Basic principles of histrionic practice. (Zelenka)

DART 170 (014). STAGECRAFT. (3)
Fundamentals of technical production. Emphasis on construction of scenery. (Mosbo, Staff)

DART 170A (014A). STAGECRAFT. (3)
For Dramatic Art majors only. (Mosbo, Staff)

DART 180 (017). MAKE-UP. (2)
One lecture and one laboratory period a week. A lecture-laboratory course in the theory and practice of stage make-up, covering basic requirements as to age, type, character, race, and period. (Staff)

DART 311 (113). PLAY PRODUCTION. (3)
Prerequisite, DART 110 or consent of instructor. Development of procedure followed by the director in preparing plays for public performance. (Rosenthal)

DART 314 (114). THE FILM AS AN ART FORM. (3)
A study of the motion picture as a developing form of entertainment, communication, and artistic expression. A series of significant American and foreign films are viewed to illustrate the artistic, historical, and sociological trends of the twentieth century. (Niemeyer)

DART 330 (129). PLAY DIRECTING. (3)
Prerequisite, DART 120 or consent of instructor. A lecture-laboratory course dealing with the fundamentals of script cutting, pacing, movement, blocking, and rehearsal routine as applied to the directing of plays. (O'Leary)

DART 375 (175). STAGE DESIGN. (3)
Prerequisite, DART 170 or consent of instructor. The theory of stage design and lighting. Making of plans as coordinate elements of scenic design. (Vaughan)

DART 390 (131). HISTORY OF THE THEATRE. (3)
A survey of dramatic production from early origin to 1800. (Niemeyer)

DART 391 (132). HISTORY OF THE THEATRE. (3)
A survey of dramatic production from 1800 to the present. (Niemeyer)

DART 420 (171). STYLES AND THEORIES OF ACTING. (3)
Prerequisite, DART 120 or consent of instructor. The study and application of historical styles and theories of acting. (Pugliese, O'Leary)

DART 430 (130). PLAY DIRECTING II. (3) (Meersman)

DART 440 (127). CHILDREN'S DRAMATICS. (3)
Principles and methods necessary for staging children's productions on the elementary school level. Major emphasis on creative dramatics; the application of creative dramatics in the school room, and the values gained by the child in this activity. Students will conduct classes in formal and creative dramatics which will culminate in children's programs. (McKerrow)

DART 440A (127A). CHILDREN'S DRAMATICS. (3)
For Dramatic Art Majors only. (McKerrow)

DART 476 (176). PRINCIPLES AND THEORIES OF STAGE LIGHTING. (3)
Prerequisite, DART 375. A study of composition, control, and instrumentation in theatrical lighting. (Vaughan)

DART 479 (139). THEATRE WORKSHOP. (3)
Prerequisite, DART 120 or 170. A laboratory course designed to provide the student with practical experience in all phases of theatre production. (Vaughan)

DART 480 (177). STAGE COSTUMING I. (3)
Prerequisite, DART 252. Basic principles of stage costuming. (Slattum)

DART 499 (111). SEMINAR. (3)
Prerequisites, senior standing and consent of instructor. Present-day drama research. (Pugliese, Staff)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

DART 600 (261). INTRODUCTION TO GRADUATE STUDY IN THEATRE. (3)

DART 669 (290). INDEPENDENT STUDY. (1-3)

DART 678 (275). THEORY OF VISUAL DESIGN FOR THE PERFORMING ARTS. (3)

DART 688 (272). SPECIAL PROBLEMS IN DRAMA. (3)

DART 689 (273). THEORIES OF THE DRAMA. (3)

DART 698 (270). SEMINAR: STUDIES IN THEATRE. (3)

DART 699 (271). THE THEORY OF PRE-MODERN DRAMATIC PRODUCTION. (3)

DART 799 (399). THESIS RESEARCH. (Cr. Arr.)

RADIO AND TELEVISION

RATV 124 (024). MASS COMMUNICATION IN 20TH-CENTURY SOCIETY. (3)
A problem centered approach to the study of mass communication and the impact of media on contemporary society. Each semester the media treatment of a contemporary social, economic or environmental issue is used as a focus for study of the principles, techniques and effects of mass media. Students produce simple radio, television and film material on the selected issue. (LeDuc)

RATV 222 (022). INTRODUCTION TO RADIO AND TELEVISION. (3)
Prerequisite for all courses in radio except RATV 124. The development, scope and influence of American broadcasting and telecasting, including visits to local radio and television stations. (Weiss, duMonceau)

RATV 302 (102). RADIO PRODUCTION. (3)
Prerequisites, RATV 222 and consent of instructor. A study of the multiple problems facing the producer. Special emphasis is given to acoustic setup, casting, 'miking,' timing, cutting, and the coordination of personnel factors involved in the production of radio programs. (Kirkley)

RATV 315 (115). RADIO AND TELEVISION IN RETAILING. (3)
Limited to students in the College of Home Economics. Prerequisite, SPCH 100 or 107. Writing and production of promotional programs for the merchandising of wearing apparel and home-furnishings. Collaboration with the Washington and Baltimore radio stations and retail stores. (Kirkley)

RATV 317 (117). RADIO AND TELEVISION CONTINUITY WRITING. (3)
Prerequisite, RATV 222 or consent of instructor. A study of the principles, methods and limitations of writing for radio and television. Application will be made in the writing of general types of continuities and commercials. (duMonceau)

RATV 340 (140). PRINCIPLES OF TELEVISION PRODUCTION. (3)
Prerequisite, RATV 222. A study of the theory, methods, techniques, and problems of television production and direction. Units of study covering television cameras and lenses, lighting theory and practices, scenery and properties, costumes and makeup, graphic arts and special effects are included. Observation of production procedures at nearby television stations. Application will be made through crew assignments for University-produced television programs. (McCleary)

RATV 346 (146) TELEVISION NEWS AND PUBLIC AFFAIRS. (3)
Prerequisite, RATV 317 or JOUR 360. Training in presentation of television news, interviews, discussions, and forums. (McCleary)

RATV 347 (147). ANALYSIS OF BROADCASTING PROCESSES AND RESULTS. (3)
Prerequisite, RATV 222 or consent of instructor. Survey of the more common analytic approaches, methods, and results in the field of radio and television. (duMonceau)

RATV 355 (155). FILM PRODUCTION. (3)
Prerequisite, consent of instructor. A study of the theoretical and practical aspects of 16 mm film production. Through reading and practice, students are familiarized with basic cinematography, lighting, editing, pictorial composition, and film continuity as a communication arts medium. (Weiss)

RATV 411 (111). SEMINAR. (3)
Prerequisites, senior standing and consent of instructor. Present day radio-television-film research. (Staff)

RATV 440 (148). TELEVISION DIRECTION. (3)
Two-hour lecture, three-hour laboratory. Prerequisites, RATV 222, 340. Principles of television direction including analysis of script, casting, rehearsing, production, and video control. (Weiss)

RATV 449 (149). TELEVISION WORKSHOP. (3)
Two-hour lecture, four-hour laboratory. Prerequisites, RATV 222, 340, 440 or consent of instructor. (Staff)

RATV 450 (150). RADIO AND TELEVISION STATION MANAGEMENT. (3)
Prerequisite, RATV 222 or consent of instructor. Broadcasting regulations, licenses, personnel functions, sales, advertising, and program and station promotion. (Kirkley)

RATV 451 (151). BROADCAST PROGRAMMING AND CRITICISM. (3)
An investigation of the professional, historical, social, and psychological criticism of American radio and television, together with a critical analysis of contemporary programming trends and conventions. (Kirkley)

RATV 452 (152). INTERNATIONAL AND COMPARATIVE BROADCASTING SYSTEMS. (3)
Prerequisite, RATV 222. A comparative study of international broadcasting program policies, economic systems, control and organization. The use of broadcasting in international affairs as an instrument of propaganda, culture and information dissemination. Monitoring of overseas broadcasts, television programs and discussions with representatives of domestic and foreign international broadcast agencies.

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

RATV 600 (261). INTRODUCTION TO GRADUATE STUDY IN RADIO AND TELEVISION. (3)

RATV 640 (248). ADVANCED TELEVISION DIRECTION. (3)

RATV 648 (240). SEMINAR IN BROADCASTING. (3)

RATV 649 (241). SPECIAL PROBLEMS IN BROADCASTING. (3)

RATV 699 (290). INDEPENDENT STUDY. (1-3)

RATV 799 (399). MASTER'S THESIS RESEARCH. (Cr. Arr.)

SPEECH AND HEARING SCIENCE

Speech Clinic. No Credit.
Remedial work in minor speech defects. The work of the clinic is conducted in individual conferences and in small group meetings. Hours arranged by consultation with the respective speech instructor. (Staff)

SPHR 202 (003). FUNDAMENTALS OF GENERAL AMERICAN SPEECH. (3)
Training in auditory discrimination of speech sounds, rhythms and inflection of general American speech. Analysis of the physiological bases of speech production and the phonetic elements of speech reception. This course is required of majors in speech and hearing science and recommended for foreign students and majors in nursery and elementary education. (Staff)

SPHR 302 (105). SPEECH-HANDICAPPED SCHOOL CHILDREN. (3)
Prerequisite, SPHR 202 for undergraduates. The occurrence, identification, and treatment of speech handicaps in the classrooms. An introduction to speech pathology. (Staff)

SPHR 304 (109). SPEECH AND LANGUAGE DEVELOPMENT OF CHILDREN. (3)
Admission by consent of instructor. An analysis of normal and abnormal processes of speech and language development in children. (Bankson, Staff)

SPHR 306 (112). PHONETICS. (3)
Prerequisites, SPHR 202 or consent of instructor. Training in the recognition and production of the sounds of spoken English, with an analysis of their formation. Practice transcription. Mastery of the international phonetic alphabet. (Baker)

SPHR 310 (126). SEMANTIC ASPECTS OF SPEECH IN HUMAN RELATIONS. (3)
Prerequisite, one course in public speaking. An analysis of speech and language habits from the standpoint of general semantics. (Staff)

SPHR 312 (135). INSTRUMENTATON IN SPEECH AND HEARING SCIENCE. (3)
Prerequisite, SPHR 202. The use of electronic equipment in the measurement of speech and hearing. (Linkow)

SPHR 314 (141). INTRODUCTION TO AUDIOMETRY. (3)
Prerequisites, SPHR 202, 312. Analysis of various methods and procedures in evaluating hearing losses. Required for students whose concentration is in speech and hearing therapy. (Newby)

SPHR 402 (108). EDUCATION PHONETICS. (3)
This course is designed to relate phonetic science to the classroom. An extensive coverage of broad transcription of general American speech. Students having credit for SPHR 202 or any previous phonetics course are not eligible for this course. (Baker)

SPHR 404 (120). SPEECH PATHOLOGY. (3)
Prerequisite, SPHR 302. A continuation of SPHR 302 with emphasis on the causes and treatment of organic speech disorders. (Boss)

SPHR 406 (136). PRINCIPLES OF SPEECH THERAPY. (3)
Prerequisite, SPHR 404. Differential diagnosis of speech and language handicaps and the application of psychological principles of learning, motivation and adjustment in the treatment of speech disorders. (Farquhar)

SPHR 408 (106). CLINICAL PRACTICE. (1-5)
Prerequisites, SPHR 302 and consent of instructor. May be taken for 1-5 credit hours per semester. May be repeated for a total of 9 semester hours credit. Clinical practice in various methods of corrective procedures with various types of speech cases in the University clinic, veterans hospitals and public schools. (Boss)

SPHR 410 (138). METHODS AND MATERIALS IN SPEECH CORRECTION. (3)
Prerequisite, SPHR 404 or the equivalent. The design and use of methods and materials for diagnosis, measurement, and retraining of the speech-handicapped. (Boss)

SPHR 412 (142). SPEECH READING AND AUDITORY TRAINING. (3)
Prerequisites, SPHR 312, 314. Methods of training individuals with hearing loss to recognize, interpret and understand spoken language. Required for students whose concentration is in speech and hearing therapy. (Doudna, Staff)

SPHR 414 (111). SEMINAR. (3)
Prerequisites, senior standing and consent of instructor. Present-day speech and hearing research. (Newby)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

SPHR 601 (202). TECHNIQUES OF RESEARCH IN SPEECH AND HEARING. (3)

SPHR 602 (212). ADVANCED SPEECH PATHOLOGY. (3)

SPHR 604 (203). EXPERIMENTAL PHONETICS. (3)

SPHR 606 (214). CLINICAL AUDIOMETRY. (3)

SPHR 610 (219). SPEECH DISORDERS OF THE BRAIN-INJURED. (3)

SPHR 612 (201-A). SPECIAL PROBLEMS SEMINAR: STUTTERING. (3)

SPHR 614 (201-B). SPECIAL PROBLEMS SEMINAR: CLEFT PALATE. (3)

SPHR 616 (201-C). SPECIAL PROBLEMS SEMINAR: DELAYED SPEECH. (3)

SPHR 620 (201-D). SPECIAL PROBLEMS SEMINAR: ARTICULATION. (3)

SPHR 622 (201-E). SPECIAL PROBLEMS SEMINAR: CEREBRAL PALSY. (3)

SPHR 624 (201-F). SPECIAL PROBLEMS SEMINAR: VOICE. (3)

SPHR 628 (201-G). SPECIAL PROBLEMS SEMINAR: SPECIAL PROBLEMS OF THE DEAF. (3)

SPHR 630 (201-H). SPECIAL PROBLEMS SEMINAR: FOREIGN DIALECT. (3)

SPHR 632 (201-I). SPECIAL PROBLEMS SEMINAR: SPEECH INTELLIGIBILITY. (3)

SPHR 634 (210). ANATOMY AND PHYSIOLOGY OF SPEECH AND HEARING. (3)

SPHR 636 (216). COMMUNICATION SKILLS FOR THE HARD-OF-HEARING. (3)

SPHR 638 (201-K). SPECIAL PROBLEMS SEMINAR: MINOR RESEARCH PROBLEMS. (1-3)

SPHR 640 (207). ADVANCED PRINCIPLES OF SPEECH AND HEARING THERAPY. (3)

SPHR 642 (201-J). SPECIAL PROBLEMS SEMINAR: NEUROPHYSIOLOGY OF HEARING. (3)

SPHR 648 (211-A). ADVANCED CLINICAL PRACTICE. (1-3)

SPHR 649 (211-B). ADVANCED CLINICAL PRACTICE. (1-3)

SPHR 700 (220). EXPERIMENTAL AUDIOLOGY. (3)

SPHR 702 (206). DIAGNOSTIC PROCEDURES IN SPEECH PATHOLOGY. (3)

SPHR 704 (204). APPLIED PHONETICS. (3)

SPHR 708 (301). INDEPENDENT STUDY IN SPEECH AND HEARING SCIENCE. (1-6)

SPHR 728 (211-C). ADVANCED CLINICAL PRACTICE. (1-3)

SPHR 729 (211-D). ADVANCED CLINICAL PRACTICE. (1-3)

SPHR 799 (399). MASTER'S THESIS RESEARCH. (Cr. Arr.)

SPHR 802 (217). HEARING AND SELECTION FOR THE ACOUSTICALLY HANDICAPPED. (3)

SPHR 804 (205). ADVANCED EXPERIMENTAL PHONETICS. (3)

SPHR 805 (208). QUANTITATIVE METHODS IN SPEECH AND HEARING SCIENCE. (3)

SPHR 806 (224). THE PREPARATION OF SPEECH AND HEARING SCIENTISTS IN INSTITUTIONS OF HIGHER LEARNING. (3)

SPHR 807 (218). SPEECH AND HEARING IN MEDICAL REHABILITATION AND SPECIAL EDUCATION PROGRAMS. (3)

SPHR 810 (227). EXPERIMENTAL DESIGN IN SPEECH AND HEARING SCIENCE. (3)

SPHR 816 (221). COMMUNICATION THEORY AND SPEECH HEARING PROBLEMS. (3)

SPHR 817 (225). ADVANCED SEMANTICS. (3)

SPHR 820 (222). ADVANCED BIO-ACOUSTICS. (3)

SPHR 822 (223). ADVANCED PSYCHO-ACOUSTICS. (3)

SPHR 824 (229). CLINICAL AND SOCIO-ECONOMIC ASPECTS OF HEARING LOSS. (3)

SPHR 826 (226). LANGUAGE PROBLEMS OF THE EXCEPTIONAL CHILD. (3)

SPHR 899 (499). DOCTORAL THESIS RESEARCH. (Cr. Arr.)

ZOOLOGY

Professor and Head: Corliss.
Professors: Anastos, Brown, Grollman, Haley, Jachowski, Otto, Schleidt.
Research Professors: Cronin,* Flyger,* Glinos,* Koo,* Sadun,* Sprague.*
Associate Professors: Barnett, Brinkley, Clark, Contrera, Highton, Linder, Morse, Potter, Ramm.
Research Associate Professors: Eisenberg,* Mihursky,* Price.*
Assistant Professors: Goode, Imberski, Pierce, Rees.
Research Assistant Professors: Flemer.*
Research Associates: Doss, Farr, Holt.
Lecturer: McIntosh.
Instructors: Jaeger, Kaufman, Moore, Piper, Stewart.
Junior Instructors: Albert, Dey, Ivie, Harnsberger, Melhop, Montviloff, Myton, Phillips, Vieweg.

The Department of Zoology offers a program leading to a B.S. with a major in zoology. A core of required courses and restricted electives in zoology, as well as supporting courses in other fields, provides an introduction to, and an appreciation of, the broad field of zoology. Through selection of additional elective courses to complete the required 30 credit hours in zoology, the student may explore in greater depth some phase of zoology which is of particular interest to him.

All majors are required to complete a minimum of 30 hours in zoology with an average grade of C. Required courses include ZOOL 101, 102, 246, and one course from each of the following groups: Group I, ZOOL 411, 413, 421, 422, 426; Group II, ZOOL 430, 475, 481. 483; Group III, ZOOL 440, 446, 456, 460, 470, 480. Additional courses to complete the required 30 hours in zoology may be selected from any of the undergraduate courses in zoology except ZOOL 201, 202, Human Anatomy and Physiology (4, 4) and ZOOL 207S, Development of the Human Body (2), which are not accepted for credit toward the major.

Supporting courses must include: CHEM 103, 104, College Chemistry I and II (4, 4); CHEM 201, 202, College Chemistry III and Laboratory (3, 2); mathematics through one year of calculus (completion of MATH 220, 221, Elementary Calculus (3, 3) or MATH 140, 141, Analysis I, II (4, 4); PHYS 121, 122, Fundamentals of Physics (4, 4); and one of the following courses: AGRI 401, Agricultural Biometrics (3); CHEM 219, Elements of Quantitative Analysis (4); MATH 240, Linear Algebra (4); PSYC 200, Statistical Methods in Psychology (3); SOCY 201, Introductory Statistics for Sociology (3); STAT 400, Applied Probability and Statistics I (3); or STAT 464, Introduction to Biostatistics (3). It is strongly recommended that the supporting courses in chemistry and mathematics be completed as early in the curriculum as possible. Students desiring to enter graduate study in certain areas of zoology are advised to take biochemistry, physical chemistry, statistics or advanced mathematics as a part of their undergraduate training.

*Adjunct members of the faculty

HONORS

The Department of Zoology also offers a special program for the exceptionally talented and promising student. The Honors Program emphasizes the scholarly approach to independent study rather than adherence to a rigidly prescribed curriculum. Information regarding this program may be obtained from the departmental office or from the chairman of the zoology Honors Program.

FOR UNDERGRADUATES

BIOL 101 (001). ORGANIZATION AND INTERRELATIONSHIPS IN THE BIOLOGICAL WORLD. (3)
First semester. An introductory lecture course for the nonscience major emphasizing the fundamental organization, processes and interdependence of living organisms and the biological effects associated with human influences on the ecosystem.

ZOOL 101 (001). GENERAL ZOOLOGY. (4)
Three lectures and one two-hour laboratory period a week. ZOOL 101 and 102 satisfy the freshman premedical requirement in general biology. An introduction to the modern concepts of biological principles and animal life. Emphasis will be placed upon the functional aspects of living systems with a survey of the physical and chemical bases of all life processes. (Linder)

ZOOL 102 (002). THE ANIMAL PHYLA. (4)
Two lectures and two two-hour laboratory periods a week. Prerequisites, ZOOL 101 or BOTN 101. A study of the anatomy, classification and life histories of representative animals, invertebrates and vertebrates. (Haley)

ZOOL 201 (014). HUMAN ANATOMY AND PHYSIOLOGY. (4)
Two lectures and two two-hour laboratory periods a week. Prerequisite, ZOOL 101. For students who desire a general knowledge of human anatomy and physiology. (Grollman)

ZOOL 202 (015). HUMAN ANATOMY AND PHYSIOLOGY. (4)
Two lectures and two two-hour laboratory periods a week. Prerequisite, ZOOL 201. A continuation of ZOOL 201. (Grollman)

ZOOL 205 (075). HISTORY OF ZOOLOGY. (1)
One lecture a week. Prerequisites, a general Grade Point Average (GPA) of 3.2 and a GPA in biological subjects of 3.5, or permission of the instructor A course in the history of the development of zoology involving the historical figures, experiments and ideas which contributed to modern concepts. (Otto)

ZOOL 206 (076). ZOOLOGICAL LITERATURE. (1)
One lecture a week. Prerequisites, a general Grade Point Average (GPA) of 3.2 and a GPA in biological subjects of 3.5, or permission of the instructor Discussion of zoological literature, its use and significance. (Otto)

ZOOL 207S (055S). DEVELOPMENT OF THE HUMAN BODY. (2)
Summer session Five lectures a week. A study of the main factors affecting the growth and development of the child with special emphasis on normal development. (Staff)

ZOOL 209 (077). BASIC STUDY IN ZOOLOGY. (1-4)
Prerequisites, a general Grade Point Average (GPA) of 3.2 and a GPA in biological subjects of 3.5, or permission of the instructor. Independent study, with supporting laboratory experiments, of the basic disciplines in zoology. Repeatable up to 8 hours credit. (Staff)

ZOOL 246 (006). GENETICS. (4)
Three lectures, one two-hour laboratory-discussion period per week. Prerequisites, ZOOL 101 or BOTN 101, or equivalent, and one semester of college chemistry. A consideration of the basic principles of heredity. (Potter, Barnett, Imberski)

ZOOL 290 (005). COMPARATIVE VERTEBRATE MORPHOLOGY. (4)
Two lectures and two three-hour laboratory periods a week. Prerequisites, ZOOL 101 and 102 or equivalent. A comparative study of the evolution of vertebrate organ systems supplemented by laboratory dissection and demonstrations. (Anastos)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

ZOOL 308H (151H). HONORS SEMINAR. (1)
One discussion period a week. Prerequisite, participation in honors program. Guided discussion of topics of current interest. Repeatable to total of 4 hours credit. (Staff)

ZOOL 309H (152H). HONORS INDEPENDENT STUDY. (1-4)
Prerequisite, participation in honors program. Study of classical material by way of guided independent study and laboratory experiments. Repeatable to a total of 12 hours credit. (Staff)

ZOOL 318H (153H). HONORS RESEARCH. (1-2)
Prerequisite, participation in honors program. A laboratory research problem which is required each semester during honors participation and culminates in a honors thesis. Repeatable to a total of 8 hours credit. (Staff)

ZOOL 319 (150). SPECIAL PROBLEMS IN ZOOLOGY. (1-2)
Prerequisites, major in zoology or biological sciences, a minimum of 3.0 cumulative average in the biological sciences, and consent of instructor. Research or integrated reading in zoology. A student may register several times and receive up to 8 semester hours of credit. (Staff)

ZOOL 411 (109). CELL BIOLOGY. (4)
Two lectures, one one-hour demonstration-discussion period and one three-hour laboratory period a week. Prerequisites, two years of zoology and a year of organic chemistry, or permission of the instructor. A study of cell structure and function with an emphasis on the activity of subcellular organoids and the mechanisms of coordination and control of cell function. (Brown)

ZOOL 413 (103). BIOPHYSICS. (3)
Three lectures a week. Prerequisites, one year of biology, a year of physics, and at least one semester of calculus; or permission of the instructor. An introduction to the ideas and methods used in biophysics to analyze the functional components of cells and tissues as physical-chemical systems. (Goode)

ZOOL 415 (180). CELL DIFFERENTIATION. (3)
Three lectures per week. Prerequisites, a course in embryology, cell biology, or genetic systems, or permission of the instructor. A discussion of cellular and subcellular differentiation, emphasizing the biochemical and ultrastructural bases of these development changes. (Goode)

ZOOL 421 (102). VERTEBRATE PHYSIOLOGY. (4)
Three lectures and one three-hour laboratory period a week. Prerequisites, one year of zoology and one semester of organic chemistry. An intensive study of nerve, muscle, sensory receptors and the central nervous system. (Staff)

ZOOL 422 (104). VERTEBRATE PHYSIOLOGY. (4)
Three lectures and one three-hour laboratory period a week. Prerequisites, one year of zoology and one semester of organic chemistry. An intensive study of the cardiovascular, gastrointestinal, renal and respiratory systems, and an introduction to endrocrinology, basal metabolism and reproductive physiology. (Contrera)

ZOOL 426 (105). GENERAL ENDROCRINOLOGY. (3)
Three lectures each week. Prerequisites, one year of zoology and one semester of organic chemistry. The study of the functions and the functioning of the endocrine organs of animals, with special reference to the vertebrates. (Brinkley)

ZOOL 430 (120). VERTEBRATE EMBRYOLOGY. (4)
Two lectures and two three-hour laboratory periods a week. Prerequisite, one year of zoology. Principles of developmental dynamics including organization, differentiation, morphogenesis, and developmental physiology. (Ramm)

ZOOL 440 (190). EVOLUTION. (3)
Three lectures per week. Prerequisite, a course in genetics or permission of instructor. A consideration of current thought in regard to the origin and evolution of living organisms. (Highton)

ZOOL 446 (106). MOLECULAR GENETICS. (3)
Three lectures per week. Prerequisites, a course in genetics and one year of organic chemistry. The molecular basis of gene structure and function. Regulation of differential gene expression. (Imberski)

ZOOL 456. ZOOGEOGRAPHY. (3)
Three lectures a week. Prerequisites, ZOOL 101, 102, and 290 or equivalent. Principles governing the geographical distribution of animals, with particular emphasis on vertebrates. (Potter)

ZOOL 460 (182). ETHOLOGY. (4)
Two lectures and two two-hour laboratory periods a week. Prerequisite, two years of zoology, including a course in comparative anatomy, or permission of instructor. The function, causation and evolution of behavior; laboratory analysis of the behavior of several species. (Staff)

ZOOL 470 (121). ANIMAL ECOLOGY. (3)
Two lectures and one three-hour laboratory period a week. Prerequisite, one year of zoology. The environment and its control of animal abundance, organization of populations and the biology of communities will be studied. (Morse)

ZOOL 475 (110). GENERAL PARASITOLOGY. (4)
Two lectures and two three-hour laboratory periods a week. Prerequisites, two years of zoology and one year of chemistry, or permission of the instructor. A consideration of the phenomenon of parasitism through a study of the structure, function and host relationships of parasitic organisms. (Jachowski)

ZOOL 480 (130). HYDROBIOLOGY. (4)
Two lectures and two three-hour laboratory periods a week. Prerequisite, an introductory course in ecology and one semester of chemistry. An investigation of the causal relationships of fresh water, estuarine and marine biotic communities to their environment. (Rees)

ZOOL 481 (118). THE BIOLOGY OF MARINE AND ESTUARINE INVERTEBRATES. (4)
Two lectures and two three-hour laboratory periods a week. Prerequisite, one year of zoology. An in-depth consideration of the taxonomy and functional morphology of the invertebrates, exclusive of insects. Chesapeake Bay forms and the study of living material will be emphasized.

ZOOL 482 (122). MARINE VERTEBRATE ZOOLOGY. (4)
Two lectures and two three-hour laboratory periods a week. Prerequisite, two years of zoology or permission of the instructor. A consideration of the evolution, taxonomy, morphology, physiology, behavior and ecology of marine and estuarine protochordates and vertebrates.

ZOOL 483 (129). VERTEBRATE ZOOLOGY. (4)
Two lectures and two two-hour laboratory periods a week. Prerequisite, one year of zoology or permission of instructor. The identification, classification, habits and behavior of vertebrates with emphasis on fresh water, terrestrial and aerial forms, and a consideration of the evolution of living and fossil representatives. (Staff)

ZOOL 486S (125S). FISHERY BIOLOGY AND MANAGEMENT. (5)
Summer Session. Five lectures and four three-hour lab-

oratories each week for 6 weeks. Prerequisite, one year of zoology and permission of instructor. Study of fish identification, development, life history stages, food habits, age, and growth, spawning, migration, and population dynamics. (Koo, Staff)

ZOOL 487 (245). BIOLOGY OF BIRDS. (4)
Two lectures and two three-hour laboratory periods a week. Prerequisite, a course in vertebrate zoology or permission of instructor. Emphasis will be on ecology, behavior, anatomy, systematics, and reproductive physiology, plus field studies of local birds. (Staff)

ZOOL 495 (108). ANIMAL HISTOLOGY. (4)
Two lectures and two three-hour laboratory periods per week. Prerequisites, a course in general zoology and a course in vertebrate anatomy, or permission of the instructor. A study of the microscopic anatomy, ultrastructure and histophysiology of tissues and organs of vertebrates. (Haley)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

ZOOL 608 (207). ZOOLOGY SEMINAR. (Cr. Arr.)
ZOOL 609 (208). SPECIAL PROBLEMS IN ZOOLOGY. (Cr. Arr.)
ZOOL 610 (204). CELLULAR PHYSIOLOGY. (4)
ZOOL 616 (216). ADVANCED TOPICS IN CELL BIOLOGY. (3)
ZOOL 621 (201). COMPARATIVE PHYSIOLOGY. (4)
ZOOL 624 (234). EXPERIMENTAL MAMMALIAN PHYSIOLOGY. (4)
ZOOL 625 (205). COMPARATIVE INVERTEBRATE ENDOCRINOLOGY. (3)
ZOOL 626 (236). MAMMALIAN PHYSIOLOGY. (3)
ZOOL 627 (237). COMPARATIVE VERTEBRATE ENDOCRINOLOGY. (3)
ZOOL 628 (206). ELECTROPHYSIOLOGY. (4)
ZOOL 630 (223). ANALYSIS OF ANIMAL STRUCTURE. (4)
ZOOL 640 (220). POPULATION GENETICS. (4)
ZOOL 641 (221). ECOLOGICAL GENETICS. (4)
ZOOL 650 (210). SYSTEMATIC ZOOLOGY. (4)
ZOOL 660 (235). COMPARATIVE BEHAVIOR. (4)
ZOOL 665 (215). SOCIOBIOLOGY. (4)
ZOOL 670 (240). ANALYSIS OF ANIMAL POPULATIONS. (4)
ZOOL 671 (260). QUANTITATIVE ZOOLOGY. (4)
ZOOL 708, 709 (211, 212). LECTURES IN ZOOLOGY. (1-3, 1-3)
ZOOL 730 (203). ADVANCED EMBRYOLOGY. (4)
ZOOL 770 (250). EXPERIMENTAL PARASITOLOGY. (4)
ZOOL 771 (251). HELMINTHOLOGY. (4)
ZOOL 772 (252). PROTOZOOLOGY. (4)
ZOOL 773 (253). PHYSIOLOGY OF SYMBIOSIS. (4)
ZOOL 799 (399). THESIS RESEARCH. (Cr. Arr.)
ZOOL 878 (300). ADVANCED TOPICS IN PARASITOLOGY. (Cr. Arr.)
ZOOL 899 (499). DISSERTATION RESEARCH. (Cr. Arr.)

FACULTY

COLLEGE OF ARTS AND SCIENCES

Administrative Officers

AYLWARD, Thomas J., Interim Dean of The College of Arts and Sciences and Professor of Speech and Dramatic Arts
B.S., University of Wisconsin, 1947; M.S., 1949; Ph.D., 1960.

LAFFER, Norman C., Associate Dean of the College of Arts and Sciences and Professor of Microbiology
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BOYD, Alfred C., Jr., Assistant Dean of the College of Arts and Sciences and Associate Professor of Chemistry
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Faculty

ABBATE, Donatella, Instructor in Italian
Laurea, University of Milan, 1961.

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AVILA, Wanda E., Instructor in English
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BANERJEE, Manoj K., Professor of Physics
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BANKS, Oliver T., Lecturer in Art
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BANKSON, Nicholas W., Assistant Professor of Speech and Dramatic Art
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BARNETT, Ronald J., Instructor in Music
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BAUER, Richard H., Professor Emeritus of History
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BRUNNER, Miriam, Instructor in Dance
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CATE, Allan G., Assistant Professor of English
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CAUSEY, George D., Research Professor of Speech and Dramatic Art
B.S., University of Maryland, 1950; M.A., 1951; Ph.D., Purdue University, 1954.

CELARIER, James L., Associate Professor of Philosophy
A.B., University of Illinois, 1956; M.A., 1958; Ph.D., University of Pennsylvania, 1960.

CHANG, Chung-Yun, Assistant Professor of Physics
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CHANG, Hua, Research Associate, Institute for Molecular Physics
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CHEN, Shirley, Instructor in Chinese
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Licenza Liceale, Liceo A., D'Oria, Genoa, 1945; Dottore in Lettere, University of Genoa, 1950.

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CLAPPER, Virginia M., Instructor in Classical Languages and Literatures
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COATES, Charles H., Assistant Professor of Sociology
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COHEN, Leon W., Professor of Mathematics
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COLE, Wayne S., Professor of History
B.A., Iowa State Teachers College, 1946; M.S., University of Wisconsin, 1948; Ph.D., 1951.

CONNELL, Terrence L., Assistant Professor of Mathematics
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A.B., Bryn Mawr College, 1958; M.A., University of Washington, 1962; Ph.D., Cornell University, 1969.

TOWNSEND, Betty P., Instructor in English
B.A., University of North Carolina, 1942; M.A., University of Maryland, 1961.

TRAVER, Paul, Professor of Music
B.Mus., The Catholic University of America, 1955; M.Mus., 1957; D.M.A., Stanford University, 1967.

TRIVELPIECE, Alvin W., Professor of Physics
B.S., California State Polytechnic College, 1953; M.S., California Institute of Technology, 1955; Ph.D., 1958.

TROUSDALE, Marion S., Lecturer in English
B.A., University of Michigan, 1951; M.A., University of California (Berkeley), 1955.

TRUE, Nelita, Assistant Professor of Music
B.Mus., University of Michigan, 1958; M.Mus., 1960.

TUBBS, James M., Instructor in French
A.B., University of Texas, 1962; M.A., 1969.

TURNAGE, Thomas W., Associate Professor of Psychology
A.B., University of California (Berkeley), 1958; Ph.D., 1962.

TYLER, Forrest B., Professor of Psychology
B.A., DePauw University, 1948; M.A., Ohio State University, 1950; Ph.D., 1952.

TYSON, Gerald, Assistant Professor of English
B.A., American University, 1964; M.A., Brandeis University, 1967; Ph.D., 1969.

ULRICH, Homer, Professor of Music
M.A., University of Chicago, 1939.

UNSAIN, Ignacio, Assistant Professor of Mathematics
Licenciado, Universidad Nacional de Cordoba (Argentina), 1966; Ph.D., University of California (Berkeley), 1970.

VACCARELLI, Mary C., Instructor in Italian
B.A., Rosary College, 1960; M.A., Middlebury College, 1963.

VAITUZIS, Zigfridas, Assistant Professor of Microbiology
B.A., University of Connecticut, 1959; M.S., University of Maryland, 1965; Ph.D., 1969.

VANDERSLICE, Betty R., Instructor in Mathematics
B.A., Uppsala College, 1945; M.A., University of Maryland, 1948.

VANDERSLICE, Joseph T., Professor and Chairman of Chemistry
B.S., Boston College, 1949; Ph.D., Massachusetts Institute of Technology, 1953.

VAN EGMOND, Peter G., Assistant Professor of English
B.A., Mississippi College, 1959; M.A., University of Mississippi, 1961; Ph.D., University of North Carolina, 1966.

VAN NESS, James S., Assistant Professor of History
B.A., University of Maryland, 1954; M.A., 1962; Ph.D., 1967.

VARNEDOE, Samuel L., Jr., Assistant Professor of Philosophy
B.A., University of North Carolina, 1959; M.A., New School for Social Research, 1962; Ph.D., University of Pennsylvania, 1967.

VASQUEZ, George L., Lecturer in History
A.B., Harvard University, 1962; M.A., The Johns Hopkins School of International Studies, 1964.

VAUGHAN, Charles Henry, Assistant Professor of Speech and Dramatic Art
B.S., State College, Edinboro, Pennsylvania, 1961; M.A., University of Denver, 1964.

VEITCH, Fletcher P., Professor of Chemistry
B.S., University of Maryland, 1931; M.S., 1933; Ph.D., 1935.

VESENTINI, Edoardo, Professor of Mathematics
Laurea in Scienze Matematiche, Universita' di Milano, 1950; Libera docenza in geometria, Universita' di Roma, 1956; Honorary Doctorate, University of Nice, 1966.

VILLAVICENCIO, Laura N., Instructor in Spanish
B.A., University of Havana, 1941; M.A., University of Maryland, 1967.

VIOLA, Victor E., Jr., Associate Professor of Chemistry
A.B., University of Kansas, 1957; Ph.D., University of California (Berkeley), 1961.

VITZTHUM, Richard C., Associate Professor of English
B.A., Amherst College, 1957; M.A.T., Harvard University, 1958; Ph.D., Stanford University, 1963.

WACHHAUS, Gustav E., Instructor in Music
B.S., West Chester State Teachers College, 1957; M.A., Columbia University, 1966.

WAGNER, Gretchen B., Assistant Professor of Mathematics
B.A., University of Michigan, 1960; M.A., 1962; Ph.D., 1967.

WAGNER, Susan, Instructor in Mathematics
B.A., Brooklyn College, 1959; M.A., 1967.

WAKEFIELD, John E., Assistant Professor of Music and Director of Bands
B.Mus., University of Michigan, 1963; M.Mus., 1964.

WALDROP, Robert S., Professor of Psychology
B.A., University of Oklahoma, 1934; Ph.D., University of Michigan, 1948.

WALKER, Ronald G., Instructor in English
B.A., University of Redlands, 1967; M.A., UCLA, 1968.

WALL, Nathan Sanders, Professor of Physics
B.S., Rensselaer Polytechnic Institute, 1949; Ph.D., Massachusetts Institute of Technology, 1954.

WALSH, Joseph Leonard, Professor of Mathematics
B.S., Harvard University, 1916; M.S., University of Wisconsin, 1917; Ph.D., Harvard University, 1920.

WALT, James, Assistant Professor of English
B.Ed., Duluth State Teachers College, 1936; M.A., University of Michigan, 1937; Ph.D., 1955.

WALTERS, William B., Associate Professor of Chemistry
B.S., Kansas State University, 1960; Ph.D., University of Illinois, 1964.

WARD, Charles D., Associate Professor of Psychology
B.A., Pomona College, 1958; M.A., University of North Carolina, 1962; Ph.D., 1963.

WARD, Kathryn M. Painter, Associate Professor of English
B.A., George Washington University, 1935; M.A., 1936; Ph.D., 1947.

WARNER, Charles R., Associate Professor of Mathematics
B.A., University of Toronto, 1955; M.S., University of Rochester, 1957; Ph.D., 1962.

WARREN, J. Benedict, Associate Professor of History
B.A., Duns Scotus College, 1953; M.A., University of New Mexico, 1960; Ph.D., 1963.

WEAVER, Anne S., Assistant Professor of Dance
B.A., Ohio State University, 1966; M.E.D., Wayne State University, 1969.

WEBER, Joseph, Professor of Physics
B.S., United States Naval Academy, 1940; Ph.D., The Catholic University of America, 1951.

WEIGANT, Leo A., Assistant Professor of English
A.B., University of Michigan, 1962; M.A., 1963; Ph.D., Duke University, 1969.

WEINER, Ronald M., Assistant Professor of Microbiology
B.S., Brooklyn College, 1964; M.S., Long Island University, 1967; Ph.D., Iowa State University, 1970.

WEISS, Gene, Assistant Professor of Speech and Dramatic Art
B.A., Brandeis University, 1961; M.A., New York University, 1965; Ph.D., Ohio State University, 1970.

WEISSMAN, Maryjo Kores, Instructor in English
B.A., University of Wisconsin, 1959; M.A., Ohio State University, 1960.

WELLFORD, Charles F., Assistant Professor of Sociology
B.A., University of Maryland, 1961; M.A., 1963; Ph.D., University of Pennsylvania, 1969.

WENTZEL, Donat G., Associate Professor of Astronomy
B.A., University of Chicago, 1954; B.S., 1955; M.S., 1958; Ph.D., 1960.

WESTERHOUT, Gart, Professor of Physics and Astronomy and Director of Astronomy
B.S., University of Leiden, 1950; M.S., 1954; Ph.D., 1958.

WHITE, Charles E., Professor Emeritus of Chemistry
B.S., University of Maryland, 1923; M.S., 1924; Ph.D., 1926.

WHITTAKER, Della S., Instructor in English
B.S., University of Maryland, 1964; M.A., 1968.

WHITTEMORE, E. Reed, Professor of English
B.A., Yale University, 1941.

WILLIAMS, Aubrey W., Jr., Associate Professor and Director of Anthropoloogy
B.A., University of North Carolina, 1955; M.A., 1957; Ph.D., University of Arizona, 1964.

WILLIAMS, Harry S., Instructor in English
B.S., Rensselaer Polytechnic Institute, 1957; M.A., University of Maryland, 1969.

WILLIAMS, Randall, Instructor in Dance
Mus.B., Peabody Conservatory, 1968.

WILLIAMS, William H., Assistant Professor of History
B.A., Washington and Lee University, 1956; M.A., Duke University, 1960; Ph.D., 1965.

WILLOUGHBY-MACDONALD, Barbara M., Instructor in Spanish
B.A., University of Chile, 1952; Licenciatura, 1961; M.A., University of Maryland, 1966.

WILSON, Bruce D., Assistant Professor of Music
B.Mus., University of Michigan, 1960; M.Mus., 1964.

WILSON, Gayle E., Associate Professor of English
B.A., Wayne State University, 1960; M.A., University of Rochester, 1963; Ph.D., 1965.

WINDEN, William C., Assistant Professor of Music
B.A., Stanford University, 1953; M.A., University of Washington, 1961.

WINTERCORN, Eleanor S., Research Associate in Speech and Dramatic Art
B.A., Rockford College, 1956; M.S., University of Wisconsin, 1958; Ph.D., University of Maryland, 1970.

WITHERS, Josephine, Lecturer in Art
B.A., Oberlin College, 1960; M.A., Columbia University, 1965; Ph.D., 1970.

WITT, Lois L., Instructor in Dance
A.B., George Washington University, 1960.

WOLFE, Peter, Associate Professor of Mathematics
B.S., St. Lawrence University, 1959; B.E.E., Rensselaer Polytechnic Institute, 1959; M.S., Northwestern University, 1961; Ph.D., New York University, 1965.

WOLMAN, Benjamin R., Lecturer in the Institute of Criminal Justice and Criminology
B.A., University of Maryland, 1951; J.D., Harvard University, 1956.

WOLVIN, Andrew D., Assistant Professor of Speech and Dramatic Art and Secondary Education
B.S., University of Nebraska, 1962; M.A., 1963; Ph.D., Purdue University, 1968.

WOO, Ching-Hung, Associate Professor of Physics
B.S., Louisiana Technological Institute, 1958; M.S., University of California (Berkeley), 1959; Ph.D., 1962.

WOOD, John M., Instructor in English
B.A., St. Joseph's College (Phila.), 1967; M.A., University of Maryland, 1969.

WOOLDRIDGE, John B., Jr., Instructor in Spanish
B.A., University of Richmond, 1953; M.A., University of Maryland, 1969.

WRIGHT, Winthrop R., Assistant Professor of History
B.A., Swarthmore College, 1958; M.A., University of Pennsylvania, 1960; Ph.D., 1964.

YANEY, George L., Associate Professor of History
B.Mgt.E., Rensselaer Polytechnic Institute, 1952; M.A., University of Colorado, 1956; Ph.D., Princeton University, 1961.

YANG, Grace L., Assistant Professor of Mathematics
B.A., National Taiwan University, 1960; M.A., University of California (Berkeley), 1963; Ph.D., 1966.

YODH, Gaurang B., Professor of Physics
B.Sc., University of Bombay, 1948; M.Sc., University of Chicago, 1951; Ph.D., 1955.

YOUNG, Bobby G., Associate Professor and Chairman of Microbiology
B.S., Southeast Missouri State College, 1951; Ph.D., The Johns Hopkins University, 1965.

YOUNG, Frank C., Associate Professor of Physics
B.A., The Johns Hopkins University, 1957; Ph.D., University of Maryland, 1962.

ZAPOLSKY, Harold S., Assistant Professor of Physics
B.A., Shimer College, University of Chicago, 1954; Ph.D., Cornell University, 1962.

ZEDEK, Mishael, Professor of Mathematics
M.S., Hebrew University (Jerusalem), 1952; Ph.D., Harvard University, 1956.

ZEEVELD, W., Gordon, Professor of English
B.A., University of Rochester, 1924; M.A., The Johns Hopkins University, 1929; Ph.D., 1936.

ZELENKA, Ionia M., Assistant Professor of Speech and Dramatic Art
A.B., Barat College, 1946; M.F.A., The Catholic University of America, 1951.

ZELENKA, Robert, Instructor in English
B.A., Rice University, 1965; M.A., The Johns Hopkins University, 1966.

ZIPOY, David M., Associate Professor of Physics and Astronomy
B.S., University of Minnesota, 1954; Ph.D., 1957.

ZOLLER, William H., Assistant Professor of Chemistry
B.S., University of Alaska, 1965; Ph.D., Massachusetts Institute of Technology, 1969.

ZORN, Bice Sechi, Associate Professor of Physics
Dottore in Fisica, Universita di Cagliari, 1951.

ZORN, Gus Tom, Associate Professor of Physics
B.S., Oklahoma State University, 1948; M.S., University of New Mexico, 1953; Ph.D., University of Padua, 1954.

ZUCKERMAN, Benjamin, Assistant Professor of Astronomy
S.B., S.M., Massachusetts Institute of Technology, 1963; Ph.D., Harvard University, 1968.

ZWANZIG, Robert W., Research Professor, Institute for Molecular Physics and Institute for Fluid Dynamics and Applied Mathematics
B.S., Polytechnic Institute of Brooklyn, 1948; M.S., University of Southern California, 1950; Ph.D., California Institute of Technology, 1952.

Business and Public Administration

The University of Maryland is favorably located for the accommodation of students interested in business and public administration. Students interested in economics, geography, information systems management, journalism, and political science find a similarly distinct advantage in being at College Park. Downtown Washington is only 25 minutes away in one direction, while the Baltimore business district is less than an hour in the other. There is frequent transportation service from College Park to each city. Qualified students may obtain a first-hand view of the far-flung economic and political activities of the national government and may utilize the libraries and other facilities available in Washington.

The college's six instructional departments offer a broad range of curricula in professional fields and in social science disciplines. The separate programs of study frequently draw upon courses in complementary fields within the college. The six departments and the major departmental offerings are:

I. Department of Business Administration
   1. The General Curriculum in Business Administration
   2. Accounting
   3. Finance
   4. Marketing
   5. Personnel and Industrial Relations
   6. Production Management
   7. Management Science—Statistics
   8. Transportation
   9. Combined Business Administration and Law

II. Department of Economics
III. Department of Geography
IV. Department of Government and Politics
   1. General Curriculum in Government and Politics
   2. International Affairs
   3. Public Administration
V. Department of Information Systems Management
VI. Department of Journalism
VII. Bureau of Business and Economic Research
VIII. Bureau of Government Research

ENTRANCE REQUIREMENTS

Requirements for admission to the college are those of the University.

To assure a likelihood of success in the college, it is recommended that the student have four units of English, three or more units of college preparatory mathematics—including a *minimum* of two units of algebra and one unit of geometry, one or more units of history and social science, two or more units of natural science, and two or more units of foreign language. Students expecting to enroll in the College of Business and Public Administration should pursue the precollege program in high school.

STATEMENT OF POLICY ON THE TRANSFER OF CREDIT FROM OTHER INSTITUTIONS

The College of Business and Public Administration of the University of Maryland subscribes to the policy that a student's undergraduate program, below his junior year,* should include no advanced, professional-level courses. This policy is based on the conviction that the value derived from these advanced courses is materially enhanced when based upon a sound foundation in the liberal arts.

In adhering to the above policy, it is the practice of the College of Business and Public Administration to accept in transfer from another accredited institution no more than 12 semester hours of work in Business Administration courses when they have been taken as part of a curricular program below the junior year. Similar limitations may be placed upon the transfer of credit in other professional areas.

The 12 semester hours of Business Administration acceptable in transfer are specifically identified as three (3) semester hours in an introductory business course, three (3) semesters hours in business statistics, and six (6) semester hours of elementary accounting. In addition, a single course in data processing may be considered for transfer, but only for *elective credit*. Thus, it is anticipated that the student transferring from another institution will have devoted the major share of his academic effort, below the junior year, to the completion of basic requirements in the liberal arts.

DEGREES

The University confers the following degrees on students completing programs of study in departments of the College: Bachelor of Science, Master of Arts, Master of Business Administration, Doctor of Business Administration, and Doctor of Philosophy. Each candidate for a degree must file in the Registrations Office on a date announced for each semester a formal application for a degree. Candidates for degrees must attend a convocation at which degrees are conferred and diplomas are awarded.

JUNIOR STANDING

A student is permitted to register for upper division courses when granted Junior Standing by his college. The permission will be based upon earning a minimum of 56 academic hours toward his degree, completing such course requirements as the college may direct, and possessing the minimum required grade point average to remain in the University.

GRADUATION REQUIREMENTS

A minimum of 120 semester hours of credit with an average of C in addition to the specified courses in physical activities and health are required for graduation. A minimum of 57 hours of the required 120 hours must be in upper division courses, with the exception that the student may, with the consent of the dean, offer certain lower division courses in mathematics, natural science and foreign language in partial fulfillment of the requirement. Usually the departments within the College will require that the student have, in addition to an overall C average, an average of C or better in those courses comprising the student's departmental area of study. The time normally required to complete the requirements for the bachelor's degree is eight semesters.

SENIOR RESIDENCE REQUIREMENT

All candidates for degrees should plan to take their senior year in residence since the advanced work of the major study normally occurs in the last year of the undergraduate course. At least 24 of the last 30 credits must be done in residence, i.e., a student who at the time of his graduation will have completed 30 semester hours in residence may be permitted to do no more than 6 semester hours of his final 30 credits of record in another institution or to include not more than 6 semester hours of credit earned by advance standing examination, provided he secures permission in advance from his dean. The student must be enrolled in the college from which he plans to graduate when registering for the last 15 credits of his program. These requirements apply also to the third year of preprofessional combined degree programs.

GRADUATE SCHOOL

Various departments of the College offer work leading to the master's degree and the doctorate. Application for admission to the Graduate School must be made by July 15 for the fall term, December 15 for the spring term and May 15 for the summer session on blanks obtained from the Office of the Graduate School. For a detailed discussion of graduate programs and a description of graduate courses see the Graduate School catalog.)

Financial Aid and Assistance

The college has a number of graduate assistantships in the Departments of Business Administration, Economics, Geography, Journalism, and Government and Politics, and in the Bureau of Business and Economic Research and the Bureau of Governmental Research. Applications for assistantships should be made directly to the Head of the Department or Bureau concerned. (See the Graduate Catalog for rules and regulations.)

HONORS

THE DEAN'S LIST OF DISTINGUISHED STUDENTS

Any student who has passed at least 12 hours of academic work in the preceding semester, without failure of any course, and with an average grade on all courses of at least 3.5 will be placed on the Dean's List of Distinguished Students.

*The term "below the junior" is defined as that period of collegiate enrollment wherein a student has accumulated sixty or fewer, semester hours of transferable academic credit

BETA GAMMA SIGMA

The Alpha of Maryland Chapter of Beta Gamma Sigma was chartered in 1940. The purpose of this honorary society is to encourage and reward scholarship and accomplishment among students of commerce and business administration; to promote the advancement of education in the art and science of business; and to foster integrity in the conduct of business operations. Chapters of Beta Gamma Sigma are chartered only in schools holding membership in the American Association of Collegiate Schools of Business. Third and fourth year students in business administration are eligible; if in his third year, a student must rank in the highest four percent of his class, and if his fourth year, he must rank in the highest ten percent in order to be considered for selection.

THE DELTA SIGMA PI SCHOLARSHIP KEY

This is awarded annually to the student who has maintained the highest scholastic standing during the entire course of study in business administration or economics. Delta Sigma Pi was founded at New York University on November 7, 1907. The Gamma Sigma of Maryland chapter was chartered at the University in 1950. Delta Sigma Pi is a professional fraternity organized to foster the study of business in universities; to encourage scholarship, social activity, and the association of students for their mutual advancement by research and practice; to promote closer affiliation between the commercial world and students of commerce; and to further a higher standard of commercial ethics and culture, as well as the civic and commerical welfare of the community. Members are selected from the College of Business and Public Administration on the basis of leadership, scholastic standing and promise of future business success.

KAPPA TAU ALPHA

The Maryland chapter of Kappa Tau Alpha was chartered in 1961. Founded in 1910, this national honorary society has 39 chapters at universities offering graduate or undergraduate preparation for careers in professional journalism. It is dedicated to recognition and promotion of scholarship in journalism. Among its activities is an annual award for an outstanding piece of published research in journalism and mass communications.

BUSINESS ADMINISTRATION

Business organizations are set up primarily for the purpose of producing and distributing goods and services. Modern business administration requires a knowledge and understanding of organizational structures, operations and environments. The curricula of the Department of Business Administration emphasize the principles and problems involved in the development of organizations and in the formulation and implementation of their policies.

STUDY PROGRAMS IN THE DEPARTMENT

The programs of study in the Department of Business Administration are so arranged as to facilitate concentrations according to the major functions of business management. This plan is not, however, based on the view that these major divisions are independent units, but rather that each is closely related to and dependent on the others. Every student in business administration is required to complete satisfactorily a minimum number of required basic subjects in the arts, sciences and humanities as prerequisites to work in the major management fields.

A business administration honors program is open to business administration majors entering their junior year. Students must have an academic average of at least 3.0 to be eligible for admittance to this program.

FRESHMAN AND SOPHOMORE REQUIREMENTS

	Hours
ENGL 101, 201, 202 (or 171, 201, 202)	9
MATH 110, 111 (or 140 and 141) and 220	9(11)
SPCH 100	3
History	6
BSAD 110	3
BSAD 220 and 221	6
ECON 201 and 203	6
BSAD 230	3

Two science courses (one biological and one physical, and at least one of which must be a lab science) selected from the following:

Physical	Astronomy	3
	Geology	3
	Physics	3
	Chemistry	4
Biological	Botany	4
	Zoology	4
	Entomology	4
	Biology	4

A social science course (ECON 201 may be used for 3 hours of the 6 hour social science requirement) selected from the following:

GVPT 170 or 100	3
PSYC 100	3
SOCY 100	3
ANTH 101	3

A fine arts requirement of 3 hours of which the following are representative:

PHIL 100, 170, 140, 236	3
ARTH 100, 260, 261	3
MUSIC 130	3
DART 110	3
Electives (chosen with approval of advisor)	2-5
HLTH 105 (men and women)	1 sem. (2 cr.)
P.E. (men and women)	2 semesters

*Students who wish to elect a foreign language must take nine semester hours of the language or six hours at the intermediate level or higher, in order to obtain credit. Such students may use the free electives available to them for this purpose.

A TYPICAL PROGRAM FOR FIRST TWO YEARS

Freshman Year			
ENGL 101 (or 171)	3	ENGL 201	3
BSAD 110 or SPCH 100	3	SPCH 100 or BSAD 110	3
MATH 110 (or 140)	3	MATH 111 (or 141)	3
HLTH 105	2	HIST	3
Fine Arts, Social Science, or Science	3-4	Fine Arts, Social Science, or Science	3-4
P.E.	1	P.E.	1
	15-16		16-17

Sophomore Year			
ENGL 202	3	ECON 203	3
BSAD 220	3	BSAD 221	3
ECON 201	3	BSAD 230	3
MATH 220	3	History	3
Fine Arts, Social Science, or Science	3-4	Fine Arts, Social Science, or Science	3-4
	15-16		15-16

JUNIOR AND SENIOR REQUIREMENTS

BSAD 340—Business Finance	3
BSAD 350—Marketing Principles and Organization	3
BSAD 364—Management and Organization Theory	3
BSAD 380—Business Law	3
BSAD 495—Business Policies	3
Total	15

In addition to the above, two 300 or 400 level courses must be taken in economics, at least one of which must be: ECON 401, National Income Analysis; ECON 403, Intermediate Price Theory; ECON 430, Money and Banking; or ECON 440, International Economics.

At least 45 hours of the 120 semester hours of academic work required for graduation must be in business administration subjects. In addition to the requirement of an averall average of C in academic subjects, *an average of C in business administration subjects is required* for graduation. Electives in the curricula of the department may, with the consent of the advisor, be taken in any department of the University if the student has the necessary prerequisites.

GENERAL CURRICULUM IN BUSINESS ADMINISTRATION

The General Curriculum in Business Administration is designed for those who desire a broad program in management. The curriculum contains a relatively large number of elective courses. Selection is subject to approval by an advisor and must contribute to a program of courses closely balanced between (1) a functional field, (2) the various basic areas of management and (3) nonbusiness fields.

Students selecting this curriculum will take the basic courses required for all students in the Department of Business Administration. In addition, students will take:

(1) The following required courses:

	Semester Hours
BSAD 350—Marketing Management or BSAD 450 Marketing Research Methods	3
BSAD 360—Personnel Management I or BSAD 362 Labor Relations	3
BSAD 370—Principles of Transportation or BSAD 371—Traffic and Physical Distribution Management	3
BSAD 301—Electronic Data Processing or BSAD 332 Operations Research I or BSAD 385 Production Management	3
BSAD 482—Business and Government	3
	15

(2) three semester hours from the following:

BSAD 311—Intermediate Accounting
BSAD 330—Business Statistics II
BSAD 440—Financial Management
BSAD 481—Public Utilities

3

Total 18

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	15
Junior-senior curriculum concentration	18
Electives in 300 or 400 level economics courses at least one of which must be ECON 401, 403, 430, or 440	6
Upper division electives to complete 120 s.h. required for graduation	21
Total junior-senior year requirements	60

ACCOUNTING

Accounting, in a limited sense, is the analysis, classification and recording of financial events and the reporting of the results of such events for an organization. In a broader sense, accounting consists of all financial devices for planning, controlling and appraising performance of an organization. In this broader sense, accounting includes among its many facets financial planning, budgeting, accounting systems, financial management controls, financial analysis of performance, financial reporting, internal and external auditing, and taxation of business.

The accounting curriculum provides an educational foundation for careers in accounting and a foundation for future advancement in other management areas whether in private business organizations, government agencies, or public accounting firms. Students who select this curriculum will complete the freshman and sophomore requirements for all students in the Department of Business Administration.

Course requirements for the junior and senior years are:

(1) The junior-senior requirements for all students in the Department of Business Administration,
(2) the following courses:

	Semester Hours
BSAD 301—Electronic Data Processing	3
BSAD 310, 311—Intermediate Accounting	6
BSAD 321—Cost Accounting	3

	Semester Hours
BSAD 323—Income Tax Accounting	3
and 9 semester hours from the following:	
BSAD 420, 421—Undergraduate Accounting Seminar	
BSAD 320—Accounting Systems	
BSAD 422—Auditing Theory and Practice	
BSAD 424—Advanced Accounting	
BSAD 425—CPA Problems	
BSAD 427—Advanced Auditing Theory and Practice	
BSAD 426—Advanced Cost Accounting	

Thus, the upper division requirements for accounting majors are:

Junior-senior requirements for all departmental students	15
Junior-senior accounting requirements (minimum)	21
BSAD 301—Electronic Data Processing	3
Electives in 300 or 400 level economics courses at least one of which must be ECON 401, 403, 430, or 440	6
Electives (to complete 120 semester hours required for graduation)	15
Total junior-senior year requirements	60

For graduates of the University of Maryland, the educational requirement of the Maryland State Board of Public Accountancy for taking the C.P.A. examination *without practical experience* totals thirty semester hours of accounting courses plus six semester hours of business law. Students wishing to satisfy the board's requirements must include BSAD 422 in their undergraduate program. Students not wishing to satisfy the board's requirements to sit for the C.P.A. examination without experience are eligible to take the examination after obtaining two years of practical experience satisfactory to the Board.

A student planning to take the C.P.A. examination in a state other than Maryland should determine the course requirements, if any, for such state and arrange his program accordingly.

FINANCE

The finance curriculum is designed to familiarize the student with the institutions, theory and practice involved in the allocation of financial resources within the private sector, especially the firm. It is also designed to incorporate foundation study in such related disciplines as economics and the quantitative areas.

The finance curriculum provides an educational foundation for careers involving financial analysis and management, investment analysis and portfolio management, investment banking, banking and international finance; it also provides a foundation for graduate study in business administration, quantitative areas, economics, and law.

Course requirements for the junior-senior curriculum concentration in finance are:

	Semester Hours
(1) The following required courses:	
BSAD 301 Electronic Data Processing	3
ECON 430 Money and Banking	3*
BSAD 332 Operations Research I	3
BSAD 343 Investments	3
plus	
(2) one of the following courses:	
BSAD 311 Intermediate Accounting	
BSAD 440 Financial Management	
BSAD 443 Security Analysis and Valuation	
BSAD 445 Commercial Bank Management	
BSAD 481 Public Utilities	3
and	
(3) one of the following courses:	
IFSM 402 Electronic Data Processing Applications or a more advanced IFSM course	
MATH—Three semester hours of mathematics beyond the departmental requirements	
BSAD 330—Business Statistics II or a more advanced BSAD statistics course	
BSAD 434—Operations Research II or a more advanced BSAD Management Science Course	3
Total	18

The upper division requirements are summarized as follows:

Junior-senior requirements for all departmental students	15
Junior-senior curriculum concentration	18
One course in economics selected from ECON 401, 403, 431, 450, 402, and 440	3*
Electives to complete the 120 semester hours required for graduation	24
Total junior-senior year requirements	60

*Note that the economics requirements for the finance major are more restrictive than stated under JUNIOR AND SENIOR CORE REQUIREMENTS.

INSURANCE AND REAL ESTATE

Students interested in insurance or real estate may concentrate either in general business or finance and plan with their advisors a group of electives to meet their specialized needs. Courses offered in insurance and real estate include risk management, principles of risk and insurance, real estate principles, and urban land management.

MARKETING

Marketing involves the functions performed in getting goods and services from producers to users. Career opportunities exist in manufacturing, wholesaling and retailing and include sales administration, marketing research, advertising and merchandising.

Students preparing for work in marketing research are advised to elect additional courses in Management Science—Statistics.

In addition to the courses taken by all students in the Department of Business Administration, the marketing program consists of:

	Semester Hours
(1) The following required courses:	
BSAD 332—Operations Research I	3
BSAD 351—Marketing Management	3
BSAD 352—Advertising	3
BSAD 450—Marketing Research Methods	3
Total required	12
and	
(2) six semester hours from the following:	
BSAD 301—Electronic Data Processing	
BSAD 330—Business Statistics II	
BSAD 453—Industrial Marketing	
BSAD 353—Retail Management	

	Semester Hours
BSAD 451—Consumer Analysis BSAD 454—International Marketing BSAD 452—Promotion Management BSAD 371—Traffic and Physical Distribution Management	6
Total	18

Thus, the upper division requirements are:	
Junior-senior requirements for all departmental students	15
Junior-senior curriculum concentration	18
Electives in 300 or 400 level economics courses at least one of which must be ECON 401, 403, 430, or 440	6
Electives to complete 120 semester hours required for graduation	21
Total, junior-senior year requirements	60

PERSONNEL AND LABOR RELATIONS

Personnel administration has to do with the direction of human effort. It is concerned with securing, maintaining and utilizing an effective working force. People professionally trained in personnel administration find career opportunities in business, in government, in educational institutions, and in charitable and other organizations.

	Semester Hours
(1) The required courses are:	
BSAD 360—Personnel Management	3
BSAD 460—Personnel Management: Analysis & Problems	3
BSAD 464—Organizational Behavior	3
BSAD 362—Labor Relations	3
BSAD 462—Labor Legislation	3
Total required	15
And	
(2) three hours from the following:	
BSAD 467—Undergraduate Seminar in Personnel Management	
BSAD 385—Production Management	
PSYC 432—Personnel and Industrial Psychology	
PSYC 351—Tests and Measurements	
PSYC 352—Psychology of Individual Differences	
SOCY 462—Industrial Sociology	
SOCY 447—Small Group Analysis	
GVPT 411—Public Personnel Administration	
JOUR 330—Public Relations	3
Total	18

Thus, the upper division requirements are:	
Junior-senior requirements for all departmental students	15
Junior-senior curriculum concentration	18
Electives in 300 or 400 level economics courses at least one of which must be ECON 401, 403, 430, or 440	6
Electives to complete 120 semester hours required for graduation	21
Total, junior-senior year requirements	60

PRODUCTION MANAGEMENT

This curriculum is designed to acquaint the student with the problems of organization and control in the field of production management. Theory and practice with reference to organization, policies, methods, processes and techniques are surveyed, analyzed and evaluated.

The courses in addition to those required of all students in the Department of Business Administration are:

	Semester Hours
(1) The following required courses:	
BSAD 321—Cost Accounting	3
BSAD 360—Personnel Management	3
BSAD 385—Production Management	3
BSAD 485—Advanced Production Management	3
Total required	12
and	
(2) six hours from the following:	
BSAD 431—Statistical Quality Control	
BSAD 353—Industrial Marketing	
BSAD 362—Labor Relations	
BSAD 332—Operations Research I	
BSAD 371—Traffic and Physical Distribution Management	6
Total	18

Thus, the upper division requirements are:	
Junior-senior requirements for all departmental students	15
Junior-senior curriculum concentration	18
Electives in 300 or 400 level economics courses at least one of which must be ECON 401, 403, 430, or 440	6
Electives to complete 120 semester hours required for graduation	21
Total junior-senior year requirements	60

MANAGEMENT SCIENCE—STATISTICS

In the management—statistics curriculum, the student will have the option of concentrating primarily in statistics or primarily in management science. The two options are described below.

THE STATISTICS OPTION

Statistics consists of a body of methods for utilizing probability theory in decision-making processes. Important statistical activities ancillary to the decision-making process are the systematization of quantitative data and the measurement of variability. Some specialized areas within the field of statistics are: sample surveys, forecasting, quality control, design of experiments, Bayesian decision processes, actuarial statistics, and data processing. Statistical methods—for example, sample survey techniques—are widely used in accounting, marketing, industrial management, and government applications.

An aptitude for applied mathematics and a desire to understand and apply scientific methods to significant problems are important prerequisites for the would-be statistician.

Students planning to major in statistics should take two semesters of calculus.

Students selecting this curriculum will take, in addition to the courses required for all students in the Department of Business Administration:

(1) The following required courses:

	Semester Hours
BSAD 301—Electronic Data Processing	3
BSAD 330—Business Statistics II	3
BSAD 430—Sample Surveys in Business and Economics	3
BSAD 432—Statistical Analysis and Forecasting	3

and

(2) six semester hours from the following:

BSAD 302—Electronic Data Processing Applications
BSAD 450—Marketing Research Methods
BSAD 431—Statistical Quality Control
BSAD 332—Operations Research I
BSAD 434—Operations Research II
BSAD 435—Linear Programming in Business
STAT 250—Introduction to Random Variables *
STAT 400—Probability and Statistics I* 6

Totals 18

*Students majoring in statistics may not take Stat. 250 and Stat. 400 in fulfillment of their special requirements. Only one of these courses can be counted toward the necessary 18 credit hours.

THE MANAGEMENT SCIENCE OPTION

Management Science—Operations Research can be defined as the application of scientific methodology by interdisciplinary teams to problems involving the control of organized man-machine systems so as to provide solutions which best serve the purposes of the organization as a whole.

Practitioners in this field are employed by large organizations (military, governmental, private industrial, private consulting) to analyze operations in the light of organizational goals and recommend changes requisite to goal fulfillment.

Students planning to major in this field should complete at least two semesters of calculus prior to junior standing. The current Math. 220-221 is the minimum preparation, although Math. 140-141 is preferred. Students considering graduate work in this field should complete Math. 140-141-240-241 as early in their careers as possible. Note Math. 240-241 may be counted as upper division elective credit. Math. 400 is also highly recommended.

Students electing this curriculum will take, in addition to the courses required for all students in the Department of Business Administration:

(1) The following required courses:

BSAD 330—Business Statistics II	3
BSAD 332—Operations Research I	3
BSAD 434—Operations Research II	3
BSAD 435—Linear Programming in Business	3
	12

and

(2) Six semester hours from the following:

BSAD 430—Sample Surveys in Business and Economics
BSAD 432—Statistical Analysis and Forecasting
BSAD 431—Statistical Quality Control
STAT 400—Probability & Statistics I
BSAD 301—Electronic Data Processing
BSAD 302—Electronic Data Processing Applications
BSAD 401—Introduction to Systems Analysis
IFSM 410—Information Processing Problems of Administrative, Economic, and Political Systems
BSAD 385—Production Management
BSAD 485—Advanced Production Management 6

18

Thus, the upper division requirements are for both options:

Junior-senior requirements for all departmental students	15
Junior-senior curriculum concentration	18
Electives in 300 or 400 level economics courses at least one of which must be ECON 401, 403, 430, or 440	6
Electives to complete 120 s.h. required for graduation	21
Total junior-senior requirement	60

TRANSPORTATION

Transportation involves the movement of persons and goods in the satisfaction of human needs. The curriculum in transportation includes an analysis of the services and management problems, such as pricing, financing, and organization, of the five modes of transport—air, motor, pipelines, railroads, and water—and covers the scope and regulation of transportation in our economy. The effective management of transportation involves a study of the components of physical distribution and the interaction of procurement, the level and control of inventories, warehousing, material handling, transportation, and data processing.

The curriculum in transportation is designed to prepare students to assume responsible positions with carriers, governmental agencies, and traffic and physical distribution management in industry.

Course requirements are, in addition to the junior-senior requirements for all students in the Department of Business Administration:

(1) The following required courses:

BSAD 332—Operations Research I	3
BSAD 370—Principles of Transportation	3
BSAD 371—Traffic and Physical Distribution Management	3
BSAD 470—Motor Transportation	3
BSAD 473—Advanced Transportation Problems	3
Total	15

and

(2) Three semester hours to be selected from the following:

BSAD 471—Water Transportation
BSAD 472—Commercial Air Transportation
BSAD 474—Urban Transport and Urban Development
BSAD 481—Public Utilities
BSAD 392—Introduction to International Business Management 3

Total required 18

Thus, the upper division requirements are:

Junior-senior requirements for all departmental students	15
Junior-senior curriculum concentration	18
Electives in 300 or 400 level economics courses at least one of which must be ECON 401, 403, 430 or 440	6
Electives to complete 120 s.h. required for graduation	21
Total junior-senior year requirements	60

COMBINED BUSINESS ADMINISTRATION AND LAW PROGRAM

The Department of Business Administration offers a combined Business Administration-Law Curriculum in which the student completes three years in the General Curriculum in Business Administration in the department and a fourth year of work in the Law School of the University of Maryland. Admission to the Law School is contingent upon meeting the applicable standards of that school. Individual students are responsible to secure from the Law School its current admission requirements. The student must complete all the courses required of students in the department plus the courses normally required for the general curriculum in Business Administration through the junior year, plus enough credits to equal a minimum of 90 semester hours. No business law course can be included in the 90 hours. The last year of college work before entering the Law School must be completed in residence at College Park. At least 30 hours of work must be in courses numbered 300 or above.

The Bachelor of Science degree from the College of Business and Public Administration is conferred upon students who complete the first year in the Law School with an average grade of C or better

MASTER AND DOCTOR OF BUSINESS ADMINISTRATION

Candidates for the degree of Master of Business Administration and Doctor of Business Administration are accepted in accordance with the procedures and requirements for the Graduate School.

(See the Graduate School Announcements.)

Professor and Department Chairman: Taff.

Professors: Anderson, Carroll, Dawson, Fisher, Hermanson, Miner and Wright.

Associate Professors: Ashmen, Bender, Daiker, Edelson, Greer, Haslem, Hille, Hynes, Lamone, Levine, Locke, Nash, Paine and Spivey.

Assistant Professors: Falthzik, Gannon, Himes, Jolson, Kuehl, Leete, Loeb, Lynagh, Mattheiss, Neffinger, Hargrove, McNitt, Nickels, Olson, Thieblot, Widhelm, and Zabriskie.

Lecturers: Anderson, Keaton, Neuman, Poist, and Solomon.

Instructors: Bedingfield, Broden, Brown, Budnick, Bulmash, Cirafici, Coyner, Dalton, Dempsey, Dyer, Elliott, English, Finn, Gritta, Keiser, Kmetz, Longbrake, Lubell, Mattingly, Muczyk, O'Neill, Rice, Rosen, Roy, Shimp, Webb, and Wolff.

BSAD 110 (10). BUSINESS ENTERPRISE. (3)
A survey course covering the internal and functional organization of a business enterprise, its organization and control.

BSAD 220, 221 (20, 21). PRINCIPLES OF ACCOUNTING. (3, 3)
Prerequisite: sophomore standing. The principles of accounting for business enterprise and the use of accounting data in making business decisions.

BSAD 220A, 221A (20A, 21A). PRINCIPLES OF ACCOUNTING. (3, 3)
Same as BSAD 20, 21 except for non-accounting majors.

BSAD 230 (130). BUSINESS STATISTICS I. (3)
An introductory course discussing basic statistical concepts and various widely used statistical techniques, namely: ratios and percentages; the tabular and graphic presentation of statistical data; frequency distributions; measures of central tendency, variability, skewness and kurtosis; the binomial and normal probability distributions; tests of hypotheses concerning means and proportions; the estimation of means and proportions; two-variable linear correlation analysis.

FOR ADVANCED UNDERGRADUATES

BSAD 301 (101). ELECTRONIC DATA PROCESSING. (3)
Students enrolled in the Department of Business Administration curricula will register for ISFM 401. For detailed information on prerequisites and description of the course, refer to ISFM 401. The credits earned in ISFM 401 may be included in the total credits earned in the area of concentration in business administration.

BSAD 302 (102). ELECTRONIC DATA PROCESSING APPLICATIONS. (3)
Students enrolled in the Department of Business Administration curricula will register for IFSM 402. For detailed information on prerequisites and description of the course, refer to IFSM 402. The credits earned in IFSM 402 may be included in the total credits earned in the area of concentration in business administration.

BSAD 310, 311 (110, 111). INTERMEDIATE ACCOUNTING. (3, 3)
Prerequisite: BSAD 221. A comprehensive study of the theory and problems of valuation of assets, application of funds, corporation accounts and statements, and the interpretation of accounting statements.

BSAD 320 (120). ACCOUNTING SYSTEMS. (3)
Prerequisite: BSAD 220. A study of the factors involved in the design and installation of accounting systems: the organization, volume and types of transactions, charts of accounts, accounting manuals, the reporting system.

BSAD 321 (121). COST ACCOUNTING. (3)
Prerequisite: BSAD 221. A study of the basic concepts of product costing and cost analysis for management planning and control. Emphasis is placed on the role of the accountant in organizational management, analysis of cost behavior, standard cost, budgeting, responsibility accounting and relevant costs for decision making.

BSAD 323 (123). INCOME TAX ACCOUNTING. (3)
Prerequisite: BSAD 221. A study of the important provisions of the Federal Tax Laws, using illustrative examples, selected questions and problems, and the preparation of returns.

BSAD 330 (131). BUSINESS STATISTICS II. (3)
Prerequisite: BSAD 230 or equivalent. A course complementing BSAD 230. The topics covered include: trend analysis in its simpler aspects; seasonal and cycle analysis; nonlinear two-variable correlation analysis; correlation analysis of grouped data; some reference to multiple correlation analysis; the chi-square test; analysis of variance; index numbers.

BSAD 332 (136). OPERATIONS RESEARCH I. (3)
Prerequisite: BSAD 230 or consent of instructor. The philosophy, methods and objectives of operations research. Basic methods are examined and their application to functional areas of business are covered. (This course is also listed as IFSM 434 and may be taken for Information Systems Management credit.)

BSAD 340 (140). BUSINESS FINANCE. (3)
Prerequisite: BSAD 221. This course deals with principles and practices involved in the organization, financing, and rehabilitation of business enterprises; the various types of securities and their use in raising funds, apportioning income, risk, and control; intercorporate relations; and new developments. Emphasis is on solution of problems of financial policy faced by management.

BSAD 343 (143). INVESTMENTS. (3)
Prerequisite: BSAD 340. An introduction to financial investments. Topics include securities and securities markets; investment risks, returns, and constraints; portfolio policies; and institutional investment policies.

BSAD 350 (149). MARKETING PRINCIPLES AND ORGANIZATION. (3)
Prerequisite: ECON 203 or 205. This is an introductory course in the field of marketing. Its purpose is to give a general understanding and appreciation of the forces operating institutions employed, and methods followed in marketing agricultural products, natural products, services and manufactured goods.

BSAD 351 (150). MARKETING MANAGEMENT. (3)
Prerequisites: BSAD 230 and BSAD 350. A study of the work of the marketing division in a going organization. The work of developing organizations and procedures for the control of marketing activities is surveyed. The emphasis throughout the course is placed on the determination of policies, methods, and practices for the effective marketing of various forms of manufactured products.

BSAD 352 (151). ADVERTISING. (3)
Prerequisite: BSAD 350. A study of the role of advertising in the American economy; the impact of advertising on our economic and social life, the methods and techniques currently applied by advertising practitioners; the role of the newspaper, magazine, and other media in the development of an advertising campaign, modern research methods to improve the effectiveness of advertising and the organization of the advertising business.

BSAD 353 (154). RETAIL MANAGEMENT. (3)
Prerequisites: BSAD 220 and 350. Retail store organization, location, layout and store policy; pricing policies, price lines, brands, credit policies, records as a guide to buying; purchasing methods; supervision of selling; training and supervision of retail sales force; and administrative problems.

BSAD 360 (160). PERSONNEL MANAGEMENT. (3)
The basic course in personnel management includes manpower planning, recruitment, selection, development, compensation, and appraisal of employees. Explores the impact of scientific management and unionism on these functions.

BSAD 362 (163). LABOR RELATIONS. (3)
A study of the development and methods of organized groups in industry with reference to the settlement of labor disputes. An economic and legal analysis of labor union and employer association activities, arbitration, mediation, and conciliation; collective bargaining, trade agreements, strikes, boycotts, lockouts, company unions, employee representation, and injunctions.

BSAD 364 (168). MANAGEMENT AND ORGANIZATION THEORY. (3)
The development of management and organization theory, nature of the management process and function and its future development. The role of the manager as an organizer and director, the communication process, goals and responsibilities.

BSAD 370 (170). PRINCIPLES OF TRANSPORTATION. (3)
Prerequisite: ECON 203 or 205. A general course covering the five fields of transportation, their development, service, and regulation.

BSAD 371 (171). TRAFFIC AND PHYSICAL DISTRIBUTION MANAGEMENT. (3)
Prerequisite: junior standing. Examines the management aspects of the business firm in moving their raw materials and finished goods, through traffic, warehousing, industrial packaging, materials handling, and inventory. A systematic examination of the trade-off possibilities and management alternatives to minimize cost of product flow and maximizing customer service is provided.

BSAD 380 (180). BUSINESS LAW. (3)
Legal aspects of business relationships, contracts, negotiable instruments, agency partnerships, corporations, real and personal property, and sales.

BSAD 381 (181). BUSINESS LAW. (3)
Legal aspects of business relationships, contracts, negotiable instruments, agency, partnerships, corporations, real and personal property, and sales.

BSAD 385 (169). PRODUCTION MANAGEMENT. (3)
Studies the operation of a manufacturing enterprise, concentrating on the economies of production. Introduces a grounding in analytical method early so that the broad problem areas of system design, operation and control can be based upon the analytical method.

BSAD 390 (190). RISK MANAGEMENT. (3)
Prerequisite: MATH III. Designed to acquaint the student with the nature and significance of risk in business enterprise. The problems relating to both pure and speculative risk in business are considered; and methods of solution involving risk assumption, transfer, reduction, and the use of insurance are analyzed as aids in management decision making.

BSAD 391 (191). PRINCIPLES OF RISK AND INSURANCE. (3)
Prerequisite: MATH III. Emphasizes the use of insurance in resolving problems involving personal and business risks. Life, accident and health, fire and casualty, automobile, and marine insurance are examined as means of dealing with these risks. The theory and legal aspects of insurance are considered, as well as the quantitative measurement of risks.

BSAD 392 (192). INTRODUCTION TO INTERNATIONAL BUSINESS MANAGEMENT. (3)
Prerequisite: ECON 203 or 205. A study of the domestic and foreign environmental factors affecting the international operations of U.S. business firms. The course also covers the administrative aspects of international marketing, finance and management.

BSAD 393 (195). REAL ESTATE PRINCIPLES. (3)
Prerequisite: ECON 203 or 205. This course covers the nature and uses of real estate, real estate as a business, basic principles, construction problems and home ownership, city planning, and public control and ownership of real estate.

FOR GRADUATES AND ADVANCED UNDERGRADUATES

BSAD 401 (103). INTRODUCTION TO SYSTEMS ANALYSIS. (3)
Students enrolled in the Department of Business Administration curricula will register for IFSM 436. For detailed information on prerequisites and descriptions of the course, refer to IFSM 436. The credits earned in IFSM 436 may be included in the total credits earned in the area of concentration in business administration.

BSAD 420, 421 (118, 119). UNDERGRADUATE ACCOUNTING SEMINAR. (3, 3)
Prerequisite: senior standing as an accounting major or consent of instructor. Enrollment limited to upper one-third of senior class. Seminar coverage of outstanding current non-text literature, current problems and case studies in accounting.

BSAD 422 (122). AUDITING THEORY AND PRACTICE. (3)
Prerequisite: BSAD 311. A study of the principles and problems of auditing and application of accounting principles to the preparation of audit working papers and reports.

BSAD 423 (129). APPRENTICESHIP IN ACCOUNTING. (0)
Prerequisites: minimum of 20 semester hours in accounting and the consent of the accounting staff. A period of apprenticeship is provided with nationally known firms of certified public accountants from about January 15 to February 15, and for a semester after graduation.

BSAD 424 (124). ADVANCED ACCOUNTING. (3)
Prerequisite: BSAD 311. Advanced accounting theory to specialized problems in partnerships, ventures, consignments, installment sales, insurance, statement of affairs, receiver's accounts, realization and liquidation reports, and consolidation of parent and subsidiary accounts.

BSAD 425 (125). C.P.A. PROBLEMS. (3)
Prerequisite: BSAD 311, or consent of instructor. A study of the nature, form and content of C.P.A. examinations by means of the preparation of solutions to, and an analysis of, a large sample of C.P.A. problems covering the various accounting fields.

BSAD 426 (128). ADVANCED COST ACCOUNTING. (2)
Prerequisite: BSAD 321. A continuation of basic cost accounting with special emphasis on process costs, standard costs, joint costs, and by-product cost.

BSAD 427 (127). ADVANCED AUDITING THEORY AND PRACTICE. (3)
Prerequisite: BSAD 422. Advanced auditing theory and practice and report writing.

BSAD 430 (132). SAMPLE SURVEYS IN BUSINESS AND ECONOMICS. (3)
Prerequisite: BSAD 230 or equivalent. A course surveying the uses of statistics in economic and business research. The emphasis of the discussion is directed toward "cross-section" analysis as distinct from "time-series" analysis (which is given detailed attention in BSAD 432). Topics covered include: research methodology, sampling techniques and design, data-collection methods, questionnaire preparation, interviewing procedures, the evaluation of survey results, and a review of selected case studies.

BSAD 431 (134). STATISTICAL QUALITY CONTROL. (3)
Prerequisite: BSAD 230, or equivalent. A course surveying the uses of statistical principles in industry. Topics considered include: a brief review of basic statistical measures: a study of the hypergeometric, binomial, normal, and Poisson probability distributions; the sampling distributions of the mean, the standard deviation, and the range; the construction and operation of the various control charts in current use; the diagnostic significance of different findings; acceptance sampling on the basis of measurement data and on the basis of attribute data.

BSAD 432 (135). STATISTICAL ANALYSIS AND FORECASTING. (3)
Prerequisite: BSAD 230 or equivalent. A course exploring the usefulness of statistical methods in econmic prediction. Various forecasting techniques in current use are examined. Major topics receiving attention are the analysis of trends, the identification of seasonal patterns and cycles, and the measurement of economic relationships. The discussion goes beyond the points made in BSAD 330. Particularly, the uses of multiple correlation analysis are examined in great detail. Some reference is also made to the predictive potentialities of so-called anticipation statistics. Throughout the course, due attention is given to the logical aspects of the forecasing problem as distinct from its statistical side.

BSAD 434 (137). OPERATIONS RESEARCH II. (3)
Prerequisite: BSAD 332 or permission of instructor. Advanced topics in Operations Research including decision theory, probability models and inventory models. Emphasis on the mathematical formulation of business problems and implementation of model solutions.

BSAD 435 (138). LINEAR PROGRAMMING IN BUSINESS. (3)
Prerequisite: BSAD 332 or permission of instructor. Theory, formulation, interpretation, and application of the general linear transportation, assignment, and integer programming models. Emphasis is on the application of these models to large-scale business problems.

BSAD 440 (141). FINANCIAL MANAGEMENT. (3)
Prerequisite: BSAD 340. Analysis and discussion of cases and readings relating to financial decisions of the firm. The application of finance concepts to the solution of financial problems is emphasized.

BSAD 443 (144). SECURITY ANALSIS AND VALUATION. (3)
Prerequisite: BSAD 343. Study and application of the concepts, methods, models, and empirical findings to the analysis, valuation, and selection of securities, especially comon stock.

BSAD 445 (145). COMMERCIAL BANK MANAGEMENT. (3)
Prerequlsites: BSAD 340 and ECON 430. Analysis and discussion of cases and readings in comercial bank management. The loan function is emphasized; also the management of liquidity reserves, investments for income, and source of funds. Bank objectives, functions, policies, organization, structure, services, and regulation are considered.

BSAD 450 (156). MARKETING RESEARCH METHODS. (3)
Prerequisites: BSAD 230 and BSAD 350. Recommended that BSAD 132 be taken prior to this course. This course is intended to develop skill in the use of scientific methods in the acquisition, analysis and interpretation of marketing data. It covers the specialized fields of marketing research; the planning of survey projects, sample design, tabulation procedure and report preparation.

BSAD 451 (155). CONSUMER ANALYSIS. (3)
Prerequisites: BSAD 350 and 351. Recommended that Psychology 001 and 021 be taken prior to this course. Considers the growing importance of the American consumer in the marketing system and the need to understand him. Topics include the foundation considerations underlying consumer behavior such as economic, social-psychological and cultural factors. Analysis of the consumer in marketing situations—as a buyer and user of products and services—and in relation to the various individual social and marketing factors affecting his behavior. The influence of marketing communications is also considered.

BSAD 452 (158). PROMOTION MANAGEMENT. (3)
Prerequisites: BSAD 350 and BSAD 352. This course is concerned with the way in which business firms use advertising, personal selling, sales promotion, and other methods as part of their marketing program. The case study method is used to present problems taken from actual business practice. Cases studied illustrate problems in the use and coordination of demand stimulation methods as well as anlysis and planning. Research, testing and statistical control of promotional activities are also considered.

BSAD 453 (153). INDUSTRIAL MARKETING. (3)
Prerequisites: BSAD 350 plus one other marketing course. The industrial and business sector of the marketing system is considered rather than the household or ultimate consumer sector. Industrial products range from raw materials and supplies to the major equipment in a plant, business office, or institution. Topics include product planning and introduction, market analysis and forecasting, channels, pricing, field sales force management, advertising, marketing cost analysis, and government relations. Particular attention is given to industrial, business and institutional buying policies and practice and to the analysis of buyer behavior.

BSAD 454 (157). INTERNATIONAL MARKETING. (3)
Prerequisites: BSAD 350 plus any other marketing course. A study of the marketing functions from the viewpoint of the international executive. In addition to the coverage of international marketing policies relating to product adaptation, data collection and analysis, channels of distribution, pricing, communications, and cost analysis, consideration is given to the cultural, legal, financial, and organizational aspects of international marketing.

BSAD 460 (161). PERSONNEL MANAGEMENT: ANALYSIS AND PROBLEMS. (3)
Prerequisite: BSAD 360. Recommended, BSAD 230. Research findings, special readings, case analysis, simulation, and field investigations are used to develop a better understanding of personnel problems, alternative solutions and their practical ramifications.

BSAD 462 (164). LABOR LEGISLATION. (3)
Case method analysis of the modern law of industrial relations. Cases include the decisions of administrative agencies, courts and arbitration tribunals.

BSAD 464 (162). ORGANIZATIONAL BEHAVIOR. (3)
An examination of research and theory concerning the forces which contribute to the behavior of organizational members. Topics covered include: work group behavior, supervisory behavior, intergroup relations, employee goals and attitudes, communication problems, organizational change, and organizational goals and design. Prerequisite: BSAD 168.

BSAD 467 (197). UNDERGRADUATE SEMINAR IN PERSONNEL MANAGEMENT. (3)
Prerequisite: consent of instructor. This course is open only to the top one-third of undergraduate majors in personnel and labor relations and is offered during the fall semester of each year. Highlights major developments. Guest lecturers make periodic presentations.

BSAD 470 (172). MOTOR TRANSPORTATION. (3)
Prerequisite: BSAD 370. The development and scope of the motor carrier industry. different types of carriers, economics of motor transportation, service available, federal regulation, highway financing, allocation of cost to highway users, highway barriers.

BSAD 471 (173). WATER TRANSPORTATION. (3)
Prerequisite: BSAD 370. Water carriers of all types, development and types of services, trade routes, inland waterways, company organization, the American Merchant Marine as a factor in national activity.

BSAD 472 (174). COMMERCIAL AIR TRANSPORTATION. (3)
Prerequisite: BSAD 370. The air transportation system of the United States; airways, airports, airlines. Federal regulation of air transportation. Problems and services of commercial air transportation; economics, equipment, operations, financing, selling of passenger and cargo services. Air mail development and services.

BSAD 473 (175). ADVANCED TRANSPORTATION PROBLEMS. (3)
Prerequisite: BSAD 370. A critical examination of current government transportation policy and proposed solutions. Urban and intercity managerial transport problems are also considered.

BSAD 474 (176). URBAN TRANSPORT AND URBAN DEVELOPMENT. (3)
Prerequisite: ECON 203 or 205. An analysis of the role of urban transportation in present and future urban development. The interaction of transport pricing and service, urban planning, institutional restraints, and public land uses is studied.

BSAD 480 (182). LEGAL ENVIRONMENT OF BUSINESS. (3)
The course examines the principal ideas in law stressing those which are relevant for the modern business executive. Legal reasoning as it has evolved in this country will be one of the central topics of study. Several leading antitrust cases will be studied to illustrate vividly the reasoning process as well as the interplay of business, philosophy, and the various conceptions of the nature of law which give direction to the process. Examination of contemporary legal problems and proposed solutions, especially those most likely to affect the business community, are also covered.

BSAD 481 (184). PUBLIC UTILITIES. (3)
Prerequisite: ECON 203 or 205. Using the regulated industries as specific examples, attention is focused on broad and general problems in such diverse fields as constitutional law, administrative law, public administration, government control of business, advanced economic theory, accounting, valuation and depreciation, taxation, finance, engineering, and management.

BSAD 482 (189). BUSINESS AND GOVERNMENT. (3)
Prerequisite: ECON 203 or 205. A study of the role of government in modern economic life. Social control of business as a remedy for the abuses of business enterprise arising from the decline of competition. Criteria of limitations on government regulation of private enterprise.

BSAD 485 (165). ADVANCED PRODUCTION MANAGEMENT. (3)
Prerequisite: BSAD 385. A study of typical problems encountered by the factory manager. The objective is to develop the ability to analyze and solve problems in management control of production and in the formulation of production policies. Among the topics covered are plant location, production planning and control, methods analysis, and time study.

BSAD 490 (196). URBAN LAND MANAGEMENT. (3)
Covers the managerial and decision making aspects of urban land and property. Included are such subjects as land use and valuation matters.

BSAD 493 (187). HONORS STUDY. (3)
First semester of the senior year.Prerequisite: Candidacy for Honors in Business Administration. The course is designed for honors students who have elected to conduct intensive study (independent or group). The student will work under the direct guidance of a faculty advisor and the Chairman of the Honors Committee. They shall determine that the area of study is of a scope and intensity deserving of a candidate's attention. Formal written and/or oral reports on the study may be required by the faculty advisor and/or Chairman of the Honors Program. Group meetings of the candidates may be called at the discretion of the faculty advisors and/or Chairman of the Honors Committee.

BSAD 494 (188). HONORS STUDY. (3)
Second semester of the senior year. Prerequisite: BSAD 493, and continued candidacy for Honors in Business Administration. The student shall continue and complete the research initiated in BSAD 493. Additional reports may be required at the discretion of the faculty advisor and Honors Program Chairman. Group meetings may be held.

BSAD 495 (199). BUSINESS POLICIES. (3)
Prerequisites: BSAD 340, 350, 364 and senior standing. A case study course in which the aim is to have the student apply what he has learned of general management principles and their specialized functional applications of the overall management function in the enterprise.

FOR GRADUATES

See the *Graduate School catalog for descriptions.*

BSAD 710 (210). ADVANCED ACCOUNTING THEORY I. (3)
BSAD 720 (220). MANAGERIAL ACCOUNTING I. (3)
BSAD 730 (230). STATISTICAL ANALYSIS AND BUSINESS DECISIONS. (3)
BSAD 731 (231). THEORY OF SURVEY DESIGN. (3)
BSAD 732 (233). CONCEPTS & METHODS OF EXPERIMENTAL STATISTICS. (3)
BSAD 734 (234A). MANAGERIAL ANALYSIS. (3)
BSAD 735 (234B). APPLICATIONS OF MANAGEMENT SCIENCE. (3)
BSAD 736 (239). PHILOSOPHY AND PRACTICE OF MANAGEMENT SCIENCE. (3)
BSAD 737 (237). MANAGEMENT SIMULATION. (3)
BSAD 740 (240). FINANCIAL ADMINISTRATION. (3)
BSAD 743 (243). INVESTMENT ANALYSIS. (3)
BSAD 750 (250). MARKETING ADMINISTRATION. (3)
BSAD 751 (251). MARKETING COMMUNICATIONS MANAGEMENT. (3)
BSAD 752 (252). MARKETING RESEARCH METHODS. (3)
BSAD 753 (258). INTERNATIONAL MARKETING. (3)
BSAD 760 (266). PERSONNEL MANAGEMENT: MANPOWER PROCUREMENT AND DEVELOPMENT. (3)
BSAD 761 (267). PERSONNEL MANAGEMENT: MANPOWER COMPENSATION AND EVALUATION. (3)
BSAD 762 (261). COLLECTIVE BARGAINING-CURRENT PROBLEMS AND ISSUES. (3)
BSAD 763 (262). ADMINISTRATION OF LABOR RELATIONS. (3)
BSAD 764 (264). BEHAVIORAL FACTORS IN MANAGEMENT. (3)
BSAD 765 (269). APPLICATION OF BEHAVIORAL SCIENCE TO BUSINESS. (3)
BSAD 770 (270). TRANSPORTATION THEORY AND ANALYSIS. (3)

BSAD 771 (271). TRANSPORT AND PUBLIC POLICY. (3)
BSAD 772 (272). MANAGEMENT OF PHYSICAL DISTRIBUTION. (3)
BSAD 773 (273). TRANSPORTATION STRATEGIES. (3)
BSAD 774 (281). PRIVATE ENTERPRISE AND PUBLIC POLICY. (3)
BSAD 775 (282). PRODUCT, PRODUCTION AND PRICING POLICY. (3)
BSAD 777 (284). POLICY ISSUES IN PUBLIC UTILITIES. (3)
BSAD 781 (287). INTERNATIONAL BUSINESS ADMINISTRATION. (3)
BSAD 782 (288). MANAGEMENT OF THE MULTINATIONAL FIRM. (3)
BSAD 785 (260). MANAGEMENT PLANNING AND CONTROL SYSTEMS. (3)
BSAD 786 (289). DEVELOPMENT AND TRENDS IN PRODUCTION MANAGEMENT. (3)
BSAD 787 (283). MANAGEMENT POLICY FORMULATION. (3)
BSAD 799 (399). MASTER'S THESIS RESEARCH. (Cr. Arr.)
BSAD 811 (211). ADVANCED ACCOUNTING THEORY II. (3)
BSAD 812 (212). ACCOUNTING IN REGULATED INDUSTRIES. (3)
BSAD 813 (213). THE IMPACT OF TAXATION ON BUSINESS DECISIONS. (3)
BSAD 814 (214). CURRENT PROBLEMS OF PROFESSIONAL PRACTICE. (3)
BSAD 821 (221). MANAGERIAL ACCOUNTING II. (3)
BSAD 828 (298). INDEPENDENT STUDY IN BUSINESS ADMINISTRATION. (1-9)
BSAD 830 (235A). MANAGEMENT SCIENCE I — LINEAR PROGRAMMING. (3)
BSAD 831 (235B). MANAGEMENT SCIENCE II — EXTENSION OF LINEAR PROGRAMMING AND NETWORK ANALYSIS. (3)
BSAD 832 (238A). MANAGEMENT SCIENCE III — OPTIMIZATION AND NON-LINEAR PROGRAMMING. (3)
BSAD 833 (238B). MANAGEMENT SCIENCE IV — INTEGER AND DYNAMIC PROGRAMMING. (3)
BSAD 834 (326). PROBABILISTIC MODELS. (3)
BSAD 835 (232). STATISTICAL MODEL BUILDING. (3)
BSAD 840 (241). WORKING CAPITAL MANAGEMENT. (3)
BSAD 841 (242). LONG-TERM CAPITAL MANAGEMENT. (3)
BSAD 843 (244). PORTFOLIO MANAGEMENT. (3)
BSAD 845 (245). FINANCIAL INSTITUTIONS. (3)
BSAD 846 (247). INTERNATIONAL FINANCIAL ADMINISTRATION. (3)
BSAD 850 (254). MARKETING CHANNELS ANALYSIS. (3)
BSAD 851 (256). QUANTITATIVE METHODS IN MARKETING: DEMAND AND COST ANALYSIS. (3)
BSAD 852 (257). THEORY IN MARKETING. (3)
BSAD 863 (280). THE ORGANIZATION AND ITS SOCIAL ENVIRONMENT. (3)
BSAD 864 (265). THEORY OF THE INDUSTRIAL WORK GROUP. (3)
BSAD 865 (263). COMPARATIVE THEORIES OF ORGANIZATION. (3)
BSAD 866 (268). ORGANIZATIONAL CONFLICT AND CHANGE. (3)
BSAD 872 (274). BUSINESS LOGISTICS. (3)
BSAD 873 (275). TRANSPORTATION SCIENCE. (3)
BSAD 880 (285). BUSINESS RESEARCH METHODOLOGY. (3)
BSAD 899 (499). DOCTORAL THESIS RESEARCH. (1-12)

ECONOMICS

The program of studies in economics is designed to meet the needs of students who wish to concentrate either on a major or minor scale in this division of the social sciences. Students who expect to enroll in the professional schools and those who are planning to enter the fields of business, public administration, foreign service, or social service administration will find courses in economics of considerable value to them in their later work. A student of economics should choose courses to meet the requirements for his major objective. If he expects to pursue graduate study, he should consult Graduate School Announcements for the general requirements for advanced degrees.

REQUIREMENTS FOR THE ECONOMICS MAJOR

In addition to the University requirements in General Education, the student majoring in economics is required to complete a minimum of 36 semester hours in economics with an average grade of not less than C. Required courses are ECON 110, 201, 203, 401, and 403, and BSAD 230 (Statistics). Economics 421 may be taken in lieu of BSAD 230 by those with a strong background and interest in mathematics. A student will normally have earned nine credits in the lower division courses in economics prior to beginning advanced work in the junior year. These lower division courses must be completed with an average grade of not less than C.

Economics majors are expected to take ECON 401 prior to taking ECON 430, or 440 and ECON 403 prior to taking ECON 450, 454, 460 or 470. ECON 401 and 403 will provide the theoretical foundation for "sections recommended for the economics major." Special sections for economics majors may be offered in ECON 430, 440, 450 and 470.

Other courses in economics to meet the requirements of the major are to be selected with the aid of a faculty advisor. Business administration courses which may count as economics credit are BSAD 230, 330, 430, 431, 432, and 481.

Economics majors enrolled in the College of Arts and Sciences must, of course, fulfill all of the specific requirements of that college; these include, for example, work in a foreign *language*. All economics majors must take six semester hours of mathematics.

Economics majors enrolled in the College of Business and Public Administration may elect to take a foreign language or, in lieu of foreign language, may take BSAD 110 and GEOG 203.

An economics honors program is open to economics majors entering their junior year. Students must have an academic average of at least 3.0 to be eligible for admittance to this program.

SUGGESTED STUDY PROGRAM FOR ECONOMICS MAJOR

Freshman Year	Hours
ENGL 101—Composition and American Literature	3
MATH 110, 111, or 140, 141	6-8
ECON 110—Economic Developments	3
Social Science Electives	6
Fine Arts or Philosophy Elective	3
Foreign Language or BSAD 110 and Elective	6

HLTH 105—Science and Theory of Health (men and women)	2
Physical Activities (men and women)	2
Free Elective	3
Total	34-36

Sophomore Year	Hours
ENGL 201, 202—Composition and World Literature	6
ECON 201, 203—Principles of Economics	6
Foreign Language or GEOG 203 and elective	6
Natural Science (one biological and one physical)	7-8
History	6
Total	31-32

Junior and Senior Years	Hours
ECON 401—National Income Analysis	3
ECON 403—Intermediate Price Theory	3
BSAD 230—Business Statistics I	3
Electives in Economics and other subjects	51
Total	60

Professor and Department Chairman: Dillard.

Professors: Almon, Bishop, Cumberland, Gruchy, O'Connell, Olson, Schultze, Ulmer, and Wonnacott.

Associate Professors: Aaron, Bennett, Bergmann, Dodge, Dorsey, Harris, Knight, McGuire, McLoone, Meyer, and Weinstein.

Assistant Professors: Adams, Atkinson, Betancourt, Boorman, Clague, Day, Greer, Harrison, MacRae, Meer, Qualls, Schiller, Singer, and Tilton.

Instructors: Bale, Betts, Grigalunas, Kawahito, Merchant and Reck.

Lecturers: Andersen, Amuzegar, Beighley, Daddis, Denny, Fitzmaurice, Hinrichs, Karlik, King, Lady, Layher, Measday, Mills, Moore, Pierce, Schink, Shipley, Snow, Strayhorn, Tobin, and Whitman.

ECON 110 (004). ECONOMIC DEVELOPMENTS. (3)
First and second semesters. Freshman requirement in business administration curriculums. An introduction to modern economic institutions—their origins, development and present status. Commercial revolution, industrial revolution and age of mass production. Emphasis on developments in England, Western Europe and the United States.

ECON 201, 203 (031, 032). PRINCIPLES OF ECONOMICS. (3, 3)
First and second semesters. Prerequisite, sophomore standing. Required in the business administration curriculums. In ECON 201 basic concepts, the monetary system, the national accounts, national income analysis, and business cycles are introduced. In ECON 203 emphasis is placed on price theory, distribution, international trade, and economic development.
(Atkinson, Dorsey, Schultze, Staff)

ECON 205 (037). FUNDAMENTALS OF ECONOMICS. (3)
First and second semesters. Not open to students who have credit in ECON 201 and 203. Not open to freshmen or to B. P. A. students. A survey of the general principles underlying economic activity, analysis of leading economic problems in the modern world. This is the basic course in economics for students who are unable to take the more complete course provided in ECON 201 and 203. (Ulmer, Staff)

FOR GRADUATES AND ADVANCED UNDERGRADUATES

ECON 394, 395 (196, 197). HONORS SEMINAR. (3, 3)
First and second semesters. Normally taken in the junior year. Prerequisite, candidacy for honors in economics. Selected topics are investigated and written reports are submitted. (Staff)

ECON 396 (198). INDEPENDENT HONORS STUDY. (3)
First semester. Normally taken in the senior year. Prerequisites, Economics 394, 395 and candidacy for honors in Economics. Integrated reading under staff direction, leading to the preparation of a thesis in economics 397. (Staff)

ECON 397 (199). HONORS THESIS.
Second semester. Prerequisites: Economics 396 and candidacy for honors in economics. General supervision will be provided through assembled meetings with the professor in charge of the course. (Staff)

ECON 398 (190). TOPICS IN ECONOMICS. (3)
This course is designed to meet the changing interests of students and staff. Topics vary in response to those interests. This course may be repeated for credit when the subject matter changes. Students are advised to seek information about the coverage and prerequisites during the registration period. (Staff)

ECON 399 (192). INDIVIDUAL READING AND RESEARCH FOR UNDERGRADUATES. (3)
By arrangement with individual instructors. This course is designed to meet the needs of students desiring specialized instruction and guidance in subjects not otherwise covered in the course offerings. A full program of reading, research and evaluation of performance should be worked out between the student and faculty member before enrollment; may be repeated for credit. (Staff)

ECON 401 (102). NATIONAL INCOME ANALYSIS. (3)
First and second semesters. Prerequisite: ECON 203. An analysis of national income accounts and the level of national income and employment.
(Layher, Moore, Shipley)

ECON 402 (147). BUSINESS CYCLES. (3)
First semester. Prerequisite: ECON 430. A study of the causes of depressions and unemployment, cyclical and secular instability, theories of business cycles, and the problem of controlling economic instability. (Almon)

ECON 403 (132). INTERMEDIATE PRICE THEORY. (3)
First and second semesters. Prerequisite: ECON 203. Required for economics majors. An analysis of price and distribution theory with special attention to recent developments in the theory of imperfect competition.
(Day, Harrison, O'Connell, Lady)

ECON 407 (134). CONTEMPORARY ECONOMIC THOUGHT. (3)
Prerequisites: ECON 203 and senior standing. Graduate students should take ECON 705. A survey of recent trends in American, English and Continental economic thought with special attention to the work of such economists as W. C. Mitchell, J. R. Commons, T. Veblen, W. Sombart, J. A. Hobson and other contributors to the development of economic thought since 1900. (Gruchy)

ECON 411 (103). AMERICAN ECONOMIC DEVELOPMENT. (3)
First and second semesters. Prerequisites: ECON 203 or 205. Long-term trends in the American economy and analysis of the sources of output growth. Technological changes and the diffusion of new technologies. These subjects are discussed in the context of theoretical models. (Shipley)

ECON 415 (105). INTRODUCTION TO ECONOMIC DEVELOPMENT OF UNDERDEVELOPED AREAS. (3)
First and second semesters. Prerequisite: ECON 203 or 205. An analysis of the economic and social characteristics of underdeveloped areas. Recent theories of economic development, obstacles to development, policies and planning for development.
(Adams, Betancourt, Harrison)

ECON 418 (106). ECONOMIC DEVELOPMENT OF SELECTED AREAS. (3)
Prerequisite: ECON 415. Institutional characteristics of a specific area are discussed and alternative strategies and policies for development are analyzed.

ECON 418A. LATIN AMERICA (Bennett, Betancourt)
ECON 418B. ASIA (Adams)
ECON 418C. AFRICA
ECON 421 (111). QUANTITATIVE METHODS IN ECONOMICS I. (3)
First and second semesters. Prerequisites: ECON 401, 403. Economic theory as it relates to quantitative methods. Theory of statistical inference. (Boorman, MacRae)
ECON 422 (112). QUANTITATIVE METHODS IN ECONOMICS II. (3)
Second semester. Prerequisites: ECON 401, 403, 421, and ECON 425, or permission of instructor. Formulation, estimation and testing of economic models; theory of identification in linear models, multiple regression and analysis of variance; single-equation problems in econometric work and econometric methods in estimation of multi-equation structures. Examples of current research employing econometric methods. (Boorman)
ECON 425 (130). MATHEMATICAL ECONOMICS. (3)
First semester. Prerequisites: ECON 401 and 403 and one year of college mathematics. A course designed to enable economics majors to understand the simpler aspects of mathematical economics. Those parts of the calculus and algebra required for economic analysis will be presented. (MacRae)
ECON 430 (140). MONEY AND BANKING. (3)
First and second semesters. Prerequisite: ECON 203. Relation of money and credit to economic activity and prices; impact of public policy in financial markets and in markets for goods and services; policies, structure, and functions of the Federal Reserve System; organization, operation, and functions of the commercial banking system, as related particularly to questions of economic stability and public policy. (Meyer, Boorman Bennett)
ECON 431 (141). THEORY OF MONEY, PRICES AND ECONOMIC ACTIVITY. (3)
Second semester. Prerequisite: ECON 430. A theoretical treatment of the influence of money and financial markets on economic activity and prices, and of the effects of monetary policy on the markets for goods and services; the role of money in the classical and Keynesian macro-systems; topics of theoretical interest in monetary policy formation and implementation. (Meyer, Boorman)
ECON 440 (148). INTERNATIONAL ECONOMICS. (3)
First and second semesters. Prerequisite: ECON 203. A descriptive and theoretical analysis of international trade, balance of payments accounts, the mechanism of international economic adjustment, comparative costs, economics of customs unions.
(Wonnacott, Clague, Moore, Atkinson, Layher)
ECON 441 (149). INTERNATIONAL ECONOMIC POLICIES. (3)
First and second semesters. Prerequisites: ECON 440, 401, and 403. Contemporary balance of payments problems; the international liquidity controversy investment, trade and economic development; evaluation of arguments for protection. (Atkinson, Moore)
ECON 450 (142). INTRODUCTION TO PUBLIC FINANCE. (3)
First and second semesters. Prerequisites: ECON 201 and 203 or 203 and 205. A study of the role of federal, state and local governments in mobilizing resources to meet public wants; principles and policies of taxation, debt management, and government expenditures and their effects on resource allocation, stabilization of income and prices, income distribution, and economic growth. (Meer, McLoone, Shipley, Hinrichs)
ECON 451 (143). THEORY OF PUBLIC FINANCE. (3)
Second semester. Prerequisites: ECON 450 and 401 or consent of instructor. An economic analysis of the theory and practice of public finance including taxation, debt management, expenditures, and fiscal policy.
(Aaron, Singer)
ECON 454 (144). STATE AND LOCAL PUBLIC FINANCE. (3)
Prerequisite: ECON 203 or 205. Principles and problems of governmental finance with special reference to state and local jurisdictions. Topics to be covered include taxation, expenditures and intergovernmental fiscal relations. (Whitman)
ECON 460 (170). INDUSTRIAL ORGANIZATION. (3)
Prerequisite: ECON 203 or 205. Changing structure of the American economy; price policies in different industrial classifications of monopoly and competition in relation to problems of public policy. (Qualls, Greer, Tilton)
ECON 461 (171). ECONOMICS OF AMERICAN INDUSTRIES. (3)
First and second semesters. Prerequisite: ECON 203 or 205. A study of the technology, economics and geography of representative American industries.
(Measday, Greer)
ECON 470 (160). LABOR ECONOMICS. (3)
First and second semesters. Prerequisite: ECON 203 or 205. The historical development and chief characteristics of the American labor movement are first surveyed. Present-day problems are then examined in detail: wage theories, unemployment, social security, labor organization, and collective bargaining. (Knight, Weinstein)
ECON 471 (161). CURRENT PROBLEMS IN LABOR ECONOMICS. (3)
Second semester. Prerequisite: ECON 470. A detailed examination of current problems in labor economics including: labor market and manpower problems, unemployment compensation and social security, wage theories, and productivity analysis. (Knight, Weinstein)
ECON 475 (165). ECONOMICS OF POVERTY AND DISCRIMINATION. (3)
Prerequisite: ECON 203 or 205. Topics include the causes of the persistence of low income groups; the relation of poverty to technological change, to economic growth, and to education and training; economic motivations for discrimination; the economic results of discrimination; proposed remedies for poverty and discrimination. (Harrison, Schiller)
ECON 480 (131). COMPARATIVE ECONOMIC SYSTEMS. (3)
First and second semesters. Prerequisite: ECON 203 or 205. An investigation of the theory and practice of various types of economic systems. An examination and evaluation of the capitalistic system followed by an analysis of alternative types of economic systems such as fascism, socialism and communism.
(Amuzegar, Denny, Dodge, Gruchy)
ECON 482 (138). ECONOMICS OF THE SOVIET UNION. (3)
First and second semesters. Prerequisite: ECON 203 or 205. An analysis of the organization, operating principles and performance of the Soviet economy with attention to the historical and ideological background, planning, resources, industry, agriculture, domestic and foreign trade, finance, labor, and the structure and growth of national income. (Dodge)
ECON 484 (139). THE ECONOMY OF CHINA. (3)
Prerequisite: ECON 203 or 205. This analysis of the policies and performances of the Chinese economy since 1949 will begin with a survey of modern China's economic history. The course will emphasize the strategies and institutional innovations that the Chinese have adopted to overcome the probelms of economic development. Some of the economic controversies raised during the 'Cultural Revolution' will be covered in a review of the problems and prospects of the present Chinese economy. (Denny)
ECON 486 (137). THE ECONOMICS OF NATIONAL PLANNING. (3)
Prerequisite: ECON 203 or 205. An analysis of the principles and practice of economic planning with special reference to the planning problems of West European countries and the United States. (Gruchy)
ECON 490 (125). SURVEY OF URBAN ECONOMIC PROBLEMS AND POLICIES. (3)
Prerequisites: ECON 201, 203 or ECON 205. An introduction to the study of urban economics through the examination of current policy issues. Topics may include

suburbanization of jobs and residences, housing and urban renewal, urban transportation, development of New Towns, ghetto economic development, problems in services such as education and police. (Harrison)

ECON 491 (120). REGIONAL AND URBAN ECONOMICS. (3) First semester. Prerequisite: ECON 401, or consent of the instructor. Study of the theories, problems and policies of urban and regional economic development. (Harris)

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

ECON 601 (202). MACRO-ECONOMIC ANALYSIS. (3) (Aaron, Bergmann, Pierce, Wonnacott)

ECON 602 (247). ECONOMIC GROWTH AND INSTABILITY. (3) (Pierce)

ECON 603 (200). MICRO-ECONOMIC ANALYSIS. (3) (Almon, Clague, Ulmer, Pierce)

ECON 604 (201). ADVANCED MICRO-ECONOMIC ANALYSIS. (3) (Almon, Olson, Ulmer)

ECON 605 (209). WELFARE ECONOMICS. (3) (McGuire, Olson)

ECON 606 (230). HISTORY OF ECONOMIC THOUGHT. (3) (Dillard)

ECON 607 (231). ECONOMIC THEORY IN THE NINETEENTH CENTURY. (3) (Dillard)

ECON 611 (203). SEMINAR IN AMERICAN ECONOMIC DEVELOPMENT. (3)

ECON 613 (204). ORIGINS AND DEVELOPMENTS OF CAPITALISM. (3) (Olson)

ECON 615 (205). ECONOMIC DEVELOPMENT OF UNDERDEVELOPED AREAS. (3) (Bennett)

ECON 616 (206). SEMINAR IN ECONOMIC DEVELOPMENT. (3) (Bennett, Adams)

ECON 617 (207). MONEY AND FINANCE IN ECONOMIC DEVELOPMENT. (3) (Bennett, Hinrichs)

ECON 621 (211). QUANTITATIVE ECONOMICS I. (3) (Bergmann, Boorman)

ECON 622 (212). QUANTITATIVE ECONOMICS II. (3) (Bergmann, Boorman)

ECON 655 (245). CASE STUDIES IN GOVERNMENT RESOURCE ALLOCATION. (3) (McGuire, Singer)

ECON 656 (246). PUBLIC SECTOR WORKSHOP. (3) (McGuire, Singer)

ECON 661 (270). ADVANCED INDUSTRIAL ORGANIZATION. (3) (Qualls, Greer)

ECON 662 (271). INDUSTRIAL ORGANIZATION AND PUBLIC POLICY. (3) (Qualls, Greer)

ECON 671 (260). SEMINAR IN LABOR ECONOMICS. (3) (Knight, Weinstein)

ECON 672 (261). SELECTED TOPICS IN LABOR ECONOMICS. (3) (Knight, Weinstein)

ECON 682 (238). SEMINAR IN ECONOMIC DEVELOPMENT OF THE SOVIET UNION. (3) (Dodge)

ECON 686 (234). ECONOMIC GROWTH IN MATURE ECONOMIES. (3) (Gruchy)

ECON 698 (237). SELECTED TOPICS IN ECONOMICS. (3) (Staff)

ECON 705 (232). SEMINAR IN INSTITUTIONAL ECONOMIC THEORY. (3) (Gruchy)

ECON 706 (233). SEMINAR IN INSTITUTIONAL ECONOMIC THEORY. (3) (Gruchy)

ECON 721 (217). ECONOMETRICS I. (3) (Almon)

ECON 722 (218). SEMINAR IN QUANTITATIVE ECONOMICS. (3) (Almon)

ECON 725 (214). ADVANCED MATHEMATICAL ECONOMICS. (3) (Almon)

ECON 726 (215). SEMINAR IN MATHEMATICAL ECONOMICS. (3) (Almon)

ECON 731 (240). MONETARY THEORY AND POLICY. (3) (Meyer)

ECON 732 (241). SEMINAR IN MONETARY THEORY AND POLICY. (3) (Meyer)

ECON 741 (235). ADVANCED INTERNATIONAL ECONOMIC RELATIONS. (3) (Wonnacott, Clague)

ECON 742 (236). SEMINAR IN INTERNATIONAL ECONOMIC RELATIONS. (3) (Wonnacott, Clague)

ECON 751 (242). ADVANCED THEORY OF PUBLIC FINANCE. (3) (Schultze)

ECON 752 (243). SEMINAR IN PUBLIC FINANCE. (3) (Aaron)

ECON 761 (248). THE ECONOMICS OF TECHNICAL CHANGE. (3) (Tilton)

ECON 775 (265). SEMINAR IN ECONOMICS OF POVERTY AND DISCRIMINATION. (3) (Aaron, Bergmann)

ECON 776 (266). SEMINAR IN THE ECONOMICS OF HUMAN RESOURCES. (3) (McLoone, Weinstein)

ECON 791 (220). ADVANCED REGIONAL AND URBAN ECONOMICS. (3) (Cumberland)

ECON 792 (221). SEMINAR IN REGIONAL AND URBAN ECONOMICS. (3) (Harris)

ECON 799 (399). MASTER'S THESIS RESEARCH. (Staff)

ECON 899 (499). DOCTORAL THESIS RESEARCH. (Staff)

GEOGRAPHY

Geography studies the spatial patterns and interactions of natural, cultural and socio-economic phenomena on earth's surface. The field thus embraces aspects of both the physical and the social sciences, which are applied in the analysis of patterns of distribution of individual phenomena, to the study of complex interrelations of phenomena found in a given region, and to the synthesis of geographic regions. A geographer should, therefore, acquire background knowledge in certain aspects of the physical as well as the social sciences.

Field work and map analysis have been the basic tools of research for the geographer. In recent years these have been augmented by the use of techniques of air photo interpretation and presently by the development of methods of interpreting data obtained from the remote sensing devices of space satellites. Modern geography also is making increasing application of quantitative methods, including the use of statistics and systems analysis, so that mathematical training is becoming increasingly important for a successful career in geography.

Today geographers are employed in a wide range of positions. Geographers in the federal government work in the Departments of State, Interior, Defense, Agriculture, Housing and Urban Affairs, and Health, Education, and Welfare. They are on the staffs of the legislative research branch, the Library of Congress and the National Archives. At the state and local government level there is an increasing demand for geographers in planning positions. And in recent years more and more geographers have found employment in private industry working on problems of industrial and commercial location and market analysis. Teaching at all levels from elementary school through graduate work continues to employ more geographers each year. Some have found geography to be an excellent background for careers in the military, journalism and general business; others have simply found the broad perspective of geography an excellent base for a general education. Most professional positions in geography require graduate training.

REQUIREMENT FOR AN UNDERGRADUATE MAJOR

Because geography draws students with such a variety of career and education aims the department has established major programs in both the College of Business and Public Administration and in Arts and Sciences. Moreover, students in the College of Education and the Department of Secondary Education can specialize in geography as their content field.

Within any of the general major programs it is possible for the student to adjust his program to fit his particular individual interests, for the major requirement in both BPA and A & S consists of a basic core of prescribed courses and a number of electives selected by the student in consultation with a departmental advisor. The major totals 33 semester hours.

The required courses of the geography core are:

	Hours
1. Geography Core (GEOG. 201, 202, 203, 300)	12
2. Field Study (Selected from GEOG 380, 381, 382, 383, 384)	3
3. A regional course	3
4. Elective systematic and technique courses	15
Total	33

The Geography Core—The following four courses form the minimum essential base upon which advanced work in geography can be built:

GEOG. 201—Introduction to Physical Geography	3
GEOG. 202—Introducction to Cultural Geography	3
GEOG. 203—Introduction to Economic Geography	3
GEOG. 300—Introduction to Research & Writing	4

The three lower division courses are to be completed prior to Geog. 300 and all other upper division courses. Geog. 201, 202, and 203 may be taken in any order and a student may register for more than one in any semester. Geog. 300 is specifically designed as a preparation to upper division work and should be taken the first semester of the junior year. Upon consultation with a department advisor, a reasonable load of other upper division work in geography may be taken concurrently with Geog. 300.

The Field Study Requirement—The field study requirement may be completed in either of two ways, depending on which is available in the schedule: (1) by taking Geography 380—Local Field Course. 3 hrs. or (2) by taking *three out of four* of the following one-hour field study courses each stressing a different aspect of geographic field work: GEOG. 381—Field Study: Physical Geography; GEOG. 382—Field Study: Rural Areas; GEOG. 382—Field Study: Urban Geography; GEOG. 384—Field Study: Field Techniques. Normally two of the different one-hour courses will be offered each semester, and the student should arrange to take them as is convenient during the junior and senior years.

Introduction to Geography—Geography 100: Introduction to Geography is a general education course for persons who have had no previous contact with the discipline in high school or for persons planning to take only one course in geography. It provides a general overview of the field rather than of a single specialized subdivision. Credit for this course is not applied to the major.

AREAS OF SPECIALIZATION

Although the major program is flexible and can be designed to fit any individual student's own interest, several specializations attract numbers of students. They are:

Urban Geography and Regional Development—Provides preparation for careers in planning and teaching. Majors electing this specialty take departmental courses in urban geography, industrial location, transportation, and economic geography among others and supporting courses in urban sociology, urban economics, and urban transportation outside the department.

Physical Geography—For students with special interest in the natural environment and in its interaction with the works of man. This specialization consists of departmental courses in geomorphology, climatology, and resources, and of supporting courses in geology, soils, meteorology, hydorology, and botany.

Cartography—Prepares students for careers in map design, compilation and reproduction. The department offers various courses in thematic mapping, cartographic history and theory, map evaluation, and map and photo interpretation. For additional training students are advised to take supporting courses in art and civil engineering.

Cultural Geography—Of interest to students particularly concerned with the geographic aspects of population, politics, and other social and cultural phenomena, and with historical geography. In addition to departmental course offerings this specialization depends on work in sociology, anthropology, government and politics, history, and economics.

For further information on any of these areas of interest the student should contact a departmental advisor.

Geography majors in the College of Arts and Sciences must satisfy the college foreign language requirement. Majors in BPA have the option of substituting at least 12 hours in courses developing competence in quantitative methods. Some of these hours can be met by taking quantitative courses in the department. All math programs should be approved by a departmental advisor.

SUGGESTED STUDY PROGRAM FOR GEOGRAPHY

MAJORS IN THE COLLEGE OF BUSINESS AND PUBLIC ADMINISTRATION

Freshman Year	Hours
GEOG 100—Introduction to Geography	3
GEOG 201—Introduction to Physical Geography	3
BOTN 100—General Botany	4

GEOL 100—Geology	3
HISTORY—Towards general education requirement	3
ENGLISH—Composition	3
PHILOSOPHY OR FINE ARTS—Towards general education requirement	3
MATH 110 or 115—Towards general education requirement	3
HLTH 105—Health Education	2
Physical Activities—(Men and Women)	2
Electives	3
	32

Sophomore Year	Hours
GEOG 202—Introduction to Cultural Geography	3
GEOG 203—Introduction to Economic Geography	3
HISTORY—Towards general education requirement	3
ENGLISH 201, 202—World Literature	6
Two Social Sciences—Towards general education requirements	6
Electives—(depending on area of specialization)	9
	30

Junior Year	Hours
GEOG 300—Introduction to Research and Writing in Geography	3
GEOG (A Regional Course)	3
GEOG (Systematic and Techniques courses)	6
Supporting courses and electives	18-21
Alternative to foreign language (BSAD 230 or MATH 240)	3-4
	33-37

Senior Year	Hours
GEOG (Systematic Techniques courses, including 3 hours of field techniques)	12 (minimum)
Supporting courses and electives	18
	30

SUGGESTED STUDY PROGRAM FOR GEOGRAPHY MAJORS IN COLLEGE OF ARTS AND SCIENCES

Freshman Year	Hours
GEOG 100—Introduction to Geography (if needed, see description of course)	3
GEOG 201—Introduction to Physical Geography	3
BOTN 100—General Botany	4
GEOL 100—Geology	3
HISTORY—Towards general education requirements	3
ENGLISH 101—Composition	3
MATH 105 or 110—Fundamentals of Mathematics or Introduction to Mathematics	3-4
HLTH 105—Health Education	2
Physical Activities (Men and Women)	2
Foreign Language	6
	33-32

Sophomore Year	Hours
GEOG 202—Introduction to Cultural Geography	3
GEOG 203—Introduction to Economic Geography	3
HISTORY—Towards general education requirement	3
ENGLISH 201, 202—World Literature	6
PHILOSOPHY OR FINE ARTS—Towards general education requirements	3
Two Social Sciences—(Towards general education requirements	6
Foreign Language	3
SPCH 100—Public Speaking	3
	30

Junior Year	Hours
GEOG 300—Introduction to Research and Writing in Geography	3
GEOG (A Regional Course)	3
GEOG (Systematic and Techniques Courses)	6
Supporting courses and electives	21
	33

(In this group care must be taken to complete the Arts and Sciences requirement of 12 hours in natural science and mathematics)

Senior Year	Hours
GEOG (Systematic and Techniques courses, including hours of field techniques)	12 (minimum)
Supporting courses and electives	18
	30

GEOGRAPHY MINOR AND SECONDARY EDUCATION GEOGRAPHY SPECIALIZATION

College of Education Majors

Secondary Education Majors with a concentration in geography are required to take 27 hours in the content field. Geography 201, 202, and 203 and either 490 or 300 are required courses. The remaining 15 hours of the program consists of 3 hours of regional geography and 12 hours of upper-division systematic courses. For majors in Elementary Education and others needing a geography course for teaching certification Geography 1 is the require course.

Geography minors should take at least Geog. 201, 202 and 203 in the Geography core and 300 is recommended. As with the major these courses should be taken before any others.

Professor and Department Chairman: Harper.
Professors: Ahnert, Deshler, Fonaroff, Hu.
Associate Professors: Chaves, Wiedel.
Assistant Professors: Brodsky, Cirrincione, Dando, Groves, Mitchell, Thompson.
Lecturers: Lewis, Muller, Rosenthal, Yoshioka.

GEOG 100 (001). INTRODUCTION TO GEOGRAPHY. (3)
An introduction to the broad field of geography as it is applicable to the general education student. The course presents the basic rationale of variations in human occupancy of the earth and stresses geographic concepts relevant to understanding world, regional and local issues.

GEOG 201 (010). INTRODUCTORY PHYSICAL GEOGRAPHY. (3)
Examination of the basic concepts of physical geography including those involving landforms, climate, vegetation, soils, and mineral resources, and the interrelations between them.

GEOG 202 (011). INTRODUCTORY CULTURAL GEOGRAPHY. (3)
Examination of the basic concepts of human geography such as those relating to geography of political, population, settlement, and cultural phenomena.

GEOG 203 (015). INTRODUCTORY ECONOMIC GEOGRAPHY. (3)
A study of physical and economic factors that underlie production. The roles of climate, soils, and landforms; and geographic distribution of agricultural, power and mineral resources, and the nature and uses of cartographic materials.

GEOG 300 (109). INTRODUCTION TO GEOGRAPHIC RESEARCH AND WRITING. (3)
Development of research methods in geography including the formulation of problem, the establishment of hypotheses, development of structures for testing hypotheses, and practice with forms of geographic presentation. Maps, quantitative and field methods will be used as appropriate.

GEOG 310 (104). GEOGRAPHY OF MAJOR WORLD REGIONS. (3)
A geographic analysis of the patterns, problems and prospects of the world's principal human-geographic regions, including Europe, Anglo-America, the Soviet Union, the Far East, and Latin America. Emphasis upon the casual factors of differentiation and the role geographic differences play in the interpretation of the current world scene. This course is designed especially for teachers.

GEOG 370, 471 (151, 152). CARTOGRAPHY AND GRAPHICS PRACTICUM. (3, 3)
One hour lecture and two two-hour laboratory periods a week. Techniques and problems of compilation, design and construction of various types of maps and graphs. Relationships between map making and modern methods of production and reproduction. Trips to representative plants. Laboratory work directed toward cartographic problems encountered in the making of nontopographic maps. (Wiedel)

GEOG 372 (155). INTERPRETATION OF TOPOGRAPHIC MAPS AND AERIAL PHOTOGRAPHS. (3)
Two hours of lecture and two hours of laboratory per week. Interpretation of aerial photographs with emphasis on the recognition of landforms of different types and man-made features. Study of vegetation, soil and other data that may be derived from aerial photographs. Types of aerial photographs and limitations of photo interpretation. (Wray)

GEOG 380 (170). LOCAL FIELD COURSE. (3)
Training in geographic field methods and techniques. Field observation of land use in selected rural and urban areas in eastern Maryland. One lecture per week with Saturday and occasional weekend field trips. Primarily for undergraduates.

GEOG 381 (171A). FIELD STUDY—PHYSICAL. (1)

GEOG 382 (171B). FIELD STUDY—RURAL. (1)

GEOG 383 (171C). FIELD STUDY—URBAN. (1)

GEOG 384 (171D). FIELD STUDY—METHODS. (1)

GEOG 385 (180). SCIENTIFIC METHODOLOGY AND HISTORY OF GEOGRAPHY. (3)
For undergraduate and graduate majors in geography. May be taken also by students with a minimum of nine hours in systematic and six hours in regional geography. A comprehensive and systematic study of the history, nature and basic principles of geography, with special reference to the major schools of geographic thought; a critical evaluation of some of the important geographical works and methods of geographic research. (Hu)

FOR GRADUATES AND ADVANCED UNDERGRADUATES

GEOG 400 (100). REGIONAL GEOGRAPHY OF EASTERN ANGLO-AMERICA. (3)
Prerequisite: GEOG 201 or GEOG 203, or permission of the instructor. A study of the cultural and economic geography and the geographic regions of eastern United States and Canada, including an analysis of the significance of the physical basis for present-day diversification of development and the historical geographic background.

GEOG 401 (101). REGIONAL GEOGRAPHY OF WESTERN ANGLO-AMERICA. (3)
Prerequisite: GEOG 201 or GEOG 203, or permission of the instructor. A study of western United States, western Canada, and Alaska along the lines mentioned under GEOG 100.

GEOG 402 (105). GEOGRAPHY OF MARYLAND AND ADJACENT AREAS. (3)
An analysis of the physical environment, natural resources, and population in relation to agriculture, industry, transport, and trade in the state of Maryland and adjacent areas.

GEOG 406 (127). HISTORICAL GEOGRAPHY OF NORTH AMERICA BEFORE 1800. (3)
An analysis of the changing geography of the U.S. and Canada from pre-Columbian times to the end of the 18th century. Emphasis on areal variations and changes in the settlements and economies of Indian and colonial populations. Areal specialization and the changing patterns of agriculture, industry, trade, and transportation. Population growth, composition and interior expansion. Regionalization. (Mitchell)

GEOG 407 (128). HISTORICAL GEOGRAPHY OF NORTH AMERICA AFTER 1800. (3)
An analysis of the changing geography of the U.S. and Canada from 1800 to the 1920's. Emphasis on the settlement expansion and socio-economic development of the U.S., and comparisons with the Canadian experience. Immigration, economic activities, industrialization, transportation and urbanization. (Muller)

GEOG 410 (120). GEOGRAPHY OF EUROPE. (3)
First and second semesters. Agricultural and industrial development of Europe and present-day problems in relation to the physical and cultural setting of the continent and its natural resources.

GEOG 411 (129). HISTORICAL GEOGRAPHY OF EUROPE. (3)
An analysis of the changing geography of Europe at selected periods from prehistoric times until the end of the 19th century, with particular emphasis on Western Europe. Changing patterns of population, agriculture, industry, trade and transportation. Development of the nation-state. Impact of overseas expansion. Agricultural and Industrial Revolutions. (Mitchell)

GEOG 415 (122). ECONOMIC RESOURCES AND DEVELOPMENT OF AFRICA. (3)
The natural resources of Africa in relation to agricultural and mineral production; the various stages of economic development and the potentialities of the future. (Deshler)

GEOG 420 (125). GEOGRAPHY OF ASIA. (3)
Lands, climates, natural resources, and major economic activities in Asia (except Soviet Asia). Outstanding differences between major regions. (Hu)

GEOG 421 (130). ECONOMIC AND POLITICAL GEOGRAPHY OF EASTERN ASIA. (3)
Study of China, Korea, Japan, the Philippines; physical geographic setting, population, economic and political geography. Potentialities of major regions and recent developments. (Hu)

GEOG 422 (134). CULTURAL GEOGRAPHY OF CHINA AND JAPAN. (3)
Survey of geographical distribution and interpretation of cultural patterns of China and Japan. Emphasis on basic cultural institutions, outlook on life, unique characteristics of various groups. Trends of cultural change and contemporary problems. (Hu)

GEOG 423 (131). ECONOMIC AND POLITICAL GEOGRAPHY OF SOUTHEAST ASIA. (3)
Study of the Indian subcontinent, Farther India, Indonesia; physical geographic setting, population, economic and political geography. Potentialities of various countries and regions and their role in present Asia. (Hu)

GEOG 431 (110). ECONOMIC AND CULTURAL GEOGRAPHY OF CARIBBEAN AMERICA. (3)
An analysis of the physical framework, broad economic and historical trends, cultural patterns, and regional diversification of Mexico, Central America, the West Indies. (Chaves)

GEOG 432 (111). ECONOMIC AND CULTURAL GEOGRAPHY OF SOUTH AMERICA. (3)
A survey of natural environment and resources, eco-

nomic development and cultural diversity of the South American republics, with emphasis upon problems and prospects of the countries. (Chaves)

GEOG 435 (140). GEOGRAPHY OF THE SOVIET UNION. (3)
The natural environment and its regional diversity. Geographical factors in the expansion of the Russian state. The geography of agricultural and industrial production in relation to available resources, transportation problems, and diversity of population. (Dando)

GEOG 440 (118). GEOMORPHOLOGY. (3)
Study of major morphological processes, the development of land forms and the relationships between various types of land forms and land use problems. Examination of the physical features of the earth's surface and their geographic distributions. (Ahnert)

GEOG 441 (146). REGIONAL GEOMORPHOLOGY. (3)
Regional and comparative morphology, with special emphasis upon Anglo-America. (Ahnert)

GEOG 445 (119). CLIMATOLOGY. (3)
The geographic aspects of climate with emphasis on energy-moisture budgets, steady-state and non-steady state climatology, and climatic variations at both macro and micro-scales. (Dando)

GEOG 446 (145). SYSTEMATIC AND REGIONAL CLIMATOLOGY. (3)
Prerequisite: GEOG 445, or permission of instructor. Methodology and techniques of collecting and evaluating climatological information. A critical examination of climatic classifications. Distribution of world climates and their geographical implications. (Lewis)

GEOG 450 (126). CULTURAL GEOGRAPHY. (3)
Prerequisite: GEOG 201, GEOG 202, or consent of instructor. An analysis of the impact of man through his ideas and technology on the evolution of geographic landscapes. Major themes in the relationships between cultures and environments. (Fonaroff)

GEOG 451 (190). POLITICAL GEOGRAPHY. (3)
Geographical factors in national power and international relations; an analysis of the role of "geopolitics" and "geostrategy," with special reference to the current world scene. (Rosenthal, Chaves)

GEOG 452 (191). POPULATION GEOGRAPHY. (3)
Prerequisite: GEOG 201 or 203, or permission of the instructor. An analysis of world population distribution patterns as revealed by demographic data. Emphasis is placed upon a comparison of population density, growth, composition, and migration with natural resources and state of technological advancement. Case studies from the geographical literature will be used. (Fonaroff)

GEOG 455 (197). URBAN GEOGRAPHY. (3)
Origins of cities, followed by a study of elements of site and location with reference to cities. The patterns and functions of some major world cities will be analyzed. Theories of land use differentiation within cities will be appraised. (Brodsky and Groves)

GEOG 460 (160). ADVANCED ECONOMIC GEOGRAPHY I. AGRICULTURAL RESOURCES. (3)
Prerequisite: GEOG 201 or GEOG 203. The nature of agricultural resources, the major types of agricultural exploitation in the world and the geographic distribution of certain major crops and animals in relation to physical environment and economic geographic conditions. Main problems of conservation. (Deshler)

GEOG 461 (161). ADVANCED ECONOMIC GEOGRAPHY II. MINERAL RESOURCES. (3)
Prerequisite: GEOG 201 or GEOG 203. The nature and geographic distribution of the principal power, metallic and other minerals. Economic geographic aspects of modes of exploitation. Consequences of geographic distribution and problems of conservation.

GEOG 462 (163). WATER RESOURCES AND WATER RESOURCE PLANNING. (3)
GEOG 201 or 203, or permission of instructor. Water as a component of the human environment. A systematic examination of various aspects of water, including problems of domestic and industrial water supply, irrigation, hydroelectric power, fisheries, navigation, flood damage reduction and recreation. (Yoshioka)

GEOG 465 (195). GEOGRAPHY OF TRANSPORTATION. (3)
The distribution of transport routes on the earth's surface, patterns of transport routes, the adjustment of transport routes and media to conditions of the natural environment centers and their distribution. (Thompson)

GEOG 466 (196). INDUSTRIAL LOCALIZATION. (3)
Factors and trends in the geographic distribution of the manufacturing industries of the world, analyzed with reference to theories of industrial location. (Groves)

GEOG 470 (150). HISTORY AND THEORY OF CARTOGRAPHY. (3)
The development of maps throughout history. Geographical orientation, coordinates and map scales. Map projections, their nature, use and limitations. Principles of representation of features on physical and cultural maps. Modern uses of maps and relationships between characteristics of maps and use types.

GEOG 472 (153. PROBLEMS OF CARTOGRAPHIC REPRESENTATION AND PROCEDURE. (3)
Two hours lecture and two hours laboratory a week. Study of cartographic compilation methods. Principles and problems of symbolization, classification and representation of map data. Problems of representation of features at different scales and for different purposes. Place-name selection and lettering, stick-up and map composition.

GEOG 473 (154). PROBLEMS OF MAP EVALUATION. (3)
Two hours lecture and two hours laboratory a week. Schools of topographic concepts and practices. Theoretical and practical means of determining map reliability, map utility, and source materials. Nature, status and problems of topographic mapping in different parts of the world. Nontopographic special use maps. Criteria of usefulness for purposes concerned and of reliability. (Wiedel)

GEOG 476 (156). QUANTITATIVE METHODS IN GEOGRAPHY. (3)
Prerequisites: MATH 110 and 111, SOCY or BSAD 230 or consent of instructor. The geographic applications of statistical methods. Emphasis will be placed on sources of quantitative data useful to geographers, measurements of location and association and graphic analysis and representation of quantitative data. (Brodsky, Thompson)

GEOG 490 (103). GEOGRAPHIC CONCEPTS AND SOURCE MATERIALS. (3)
A comprehensive and systematic survey of geographic concepts designed exclusively for teachers. Stress will be placed upon the philosophy of geography in relation to the social and physical sciences, the use of the primary tools of geography, source materials, and the problems of presenting geographic principles. (Cirrincione)

GEOG 498 (198). TOPICAL INVESTIGATIONS. (1-3)
Independent study under individual guidance. Restricted to advanced undergraduate students with credit for at least 24 hours in geography and to graduate students. Any exception should have the approval of the head of the department.

GEOG 499 (199). UNDERGRADUATE RESEARCH. (3)
Directed regional or systematic study involving several subfields of geography, including cartographic presentation, and usually requiring field work, and leading to an undergraduate thesis.

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

GEOG 600 (201). INTRODUCTION TO GRADUATE STUDY. (3)

GEOG 601 (200). FIELD COURSE. (3)

GEOG 615 (280). GEOMORPHOLOGY. (3)

GEOG 625 (260). ADVANCED GENERAL CLIMATOLOGY. (3)

GEOG 626 (261). APPLIED CLIMATOLOGY. (3)

GEOG 628, 629 (262, 263). SEMINAR IN METEOROLOGY AND CLIMATOLOGY. (3, 3)
GEOG 638, 639 (206, 207). SEMINAR IN PHYSICAL GEOGRAPHY. (3, 3)
GEOG 648, 649 (204, 205). SEMINAR IN CULTURAL GEOGRAPHY. (3, 3)
GEOG 658 (208). SEMINAR IN HISTORICAL GEOGRAPHY. (3)
GEOG 668, 669 (202, 203). SEMINAR IN ECONOMIC GEOGRAPHY. (3, 3)
GEOG 698 (250). SEMINAR IN CARTOGRAPHY. (Cr. Arr.)
GEOG 718, 728 (220, 221). SEMINAR IN THE GEOGRAPHY OF EUROPE AND AFRICA. (3, 3)
GEOG 738, 739 (230, 231). SEMINAR IN THE GEOGRAPHY OF EAST ASIA. (3, 3)
GEOG 748, 749 (210, 211). SEMINAR IN THE GEOGRAPHY OF LATIN AMERICA. (3, 3)
GEOG 758, 759 (240, 241). SEMINAR IN THE GEOGRAPHY OF THE U.S.S.R. (3, 3)
GEOG 768 (246). SEMINAR IN THE GEOGRAPHY OF THE NEAR EAST. (3)
GEOG 788, 789 (290, 291). SELECTED TOPICS IN GEOGRAPHY. (1-3)
GEOG 799 (399). MASTER'S THESIS RESEARCH.
GEOG 899 (499). DOCTORAL THESIS RESEARCH.

GOVERNMENT AND POLITICS

The Department of Government and Politics offers programs designed to prepare students for government service, politics, foreign assignments, teaching, a variety of graduate programs ranging from business to law, and for intelligent and purposeful citizenship.

Both business and public administration and arts and sciences students may major in government and politics. At the junior/senior level they may pursue the general government curriculum or they may pursue a more specialized curriculum either in international affairs or in public administration (BPA students only).

REQUIREMENTS FOR THE GOVERNMENT AND POLITICS MAJOR

Government and Politics majors must take a minimum of 36 semester hours in government courses and may not count more than 42 hours in government toward graduation. No course in which the grade is less than C may be counted as part of the major.

The government and politics fields are as follows: (1) American government and politics; (2) comparative government; (3) international affairs; (4) political theory; (5) public administration; (6) public law; and (7) public policy and political behavior.

All government majors are required to take GVPT 100, 170, 220, and 441 or 442 (Political Theory). They must take one course from three separate government fields as designated by the department; and in addition: (a) general majors must take at least 15 GVPT semester hours at the 300-400 level; (b) majors taking the international affairs curriculum must complete at least 15 semester hours at the 300-400 level in international affairs and comparative government courses, including GVPT 300; (c) majors taking the public administration curriculum must complete at least 15 semester hours at the 300-400 level in public administration, including GVPT 410. All students majoring in government with specialization in international affairs must take a minimum of 12 semester hours in one foreign language *above the first year elementary course.* (The first year elementary requirement may be waived by high school credit or placement tests.)

All students majoring in government must fulfill the requirements of a minor, which involves the completion of 15 semester hours from approved departments other than GVPT. At least six of the 15 hours must be taken at the 300-400 level from a single department. Students majoring in government with specialization in international affairs may choose to take all minor courses either in geographical area studies or on a departmental basis; geographical area minors may be chosen, with the consent of the departmental advisor, from the following: Africa, East Asia, Europe, Latin America, the Middle East, and the Soviet Union. General majors and majors specializing in public administration may not minor in geographical area studies.

Students who major in government may apply for admission to the GVPT Honors Program during the second semester of their sophomore year. Additional information concerning the Honors Program may be obtained at the departmental offices.

FRESHMAN AND SOPHOMORE REQUIREMENTS	Hours
ECON 201, 203	6
ENGL 101, 201, 202	9
Fine Arts or Philosophy	3
GVPT 100, 170, 220	9
History	6
MATH 110, 111	6
Science (One physical science and one biological science)	7
Social Science (to fulfill Gen. Educ. Program requirement)	3
SPCH 100	3
Electives	9
	61

JUNIOR AND SENIOR REQUIREMENTS FOR THE G. and P. GENERAL CURRICULUM	Hours
GVPT 441 or 442 (Political Theory)	3
One course from each of three GVPT fields as designated by the Department	9
Additional 300-400 level GVPT courses (May not all be taken in International Affairs/Comparative Government or all in Public Administration)	15
Requirements for minor	18
Statistics	3
Electives	12
	60

JUNIOR AND SENIOR REQUIREMENTS FOR THE G. and P. INTERNATIONAL AFFAIRS CURRICULUM	Hours
GVPT 441 or 442 (Political Theory)	3
One course from each of three GVPT fields as designated by the department	9
Additional 300-400 level international affairs and comparative government courses including GVPT 300	15
Requirements for minor (Departmental or Geographical Area Studies)	18
Statistics	3
Electives	12
	60

JUNIOR AND SENIOR REQUIREMENTS FOR THE G. & P. PUBLIC ADMINISTRATION CURRICULUM

GVPT 441 or 442 (Political Theory)	3
One course from each of three GVPT fields as designated by the department	9
Additional 300-400 level public administration courses including GVPT 410	15
Requirements for minor	18
Statistics	3
Electives	12
	60

Professor and Department Chairman: Don C. Piper.

Professors: Anderson, Burdette, Dillon, Harrison, Hathorn, Hsueh, Jacobs, McNelly, Plischke.

Associate Professors: Claude, Conway, Devine, Koury, Ranald, Reeves, Stone, Terchek, Wolfe.

Assistant Professors: Bechtold, Butterworth, Chapples, Glass, Glendening, Heisler, Ingles, Lanning, McCarrick, McGregor, Melnick, Oliver, Spencer, Strouse, Werlin, Wilkenfeld.

Lecturers: Barber, Flyr, King, Levine.

GVPT 100 (003). PRINCIPLES OF GOVERNMENT AND POLITICS. (3)
A study of the basic principles and concepts of political science. This course may be used to satisfy, in part, the Social Science requirement in the General Education Program.

GVPT 170 (001). AMERICAN GOVERNMENT. (3)
This course is designed as the basic course in government and it or its equivalent is a prerequisite to other courses in the department as specified in the catalog. It is a comprehensive study of government in the United States—national, state and local.

GVPT 220 (020). INTRODUCTION TO POLITICAL BEHAVIOR. (3)
Prerequisite: GVPT 170. Development, concepts and techniques of the behavioral approach to political science. Comparison with traditional approaches.

GVPT 240 (040). POLITICAL IDEOLOGIES. (3)
Prerequisite: GVPT 170. A survey and analysis of the leading ideologies of the modern world, including anarchism, communism, socialism, fascism, nationalism, and democracy.

GVPT 260 (060). STATE AND LOCAL GOVERNMENT. (3)
Prerequisite: GVPT 170. A study of the functioning and problems of state and local government in the United States, with illustrations from Maryland jurisdictions.

GVPT 280 (090). COMPARATIVE POLITICS AND GOVERNMENT. (3)
An introduction to the field of comparative politics including exposure to the analytic frameworks through which comparative studies of politics and governmental institutions can be undertaken and a survey of the salient types of political systems.

FOR GRADUATES AND ADVANCED UNDERGRADUATES

GVPT 300 (101). INTERNATIONAL POLITICAL RELATIONS. (3)
A study of the major factors underlying international relations, the methods of conducting foreign relations, the foreign policies of the major powers, and the means of avoiding or alleviating international conflicts. This course may be used to satisfy, in part, the Social Science requirement in the General Education Program.

GVPT 390H (150H). HONORS SEMINAR IN AMERICAN GOVERNMENT AND PUBLIC ADMINISTRATION. (3)
Prerequisite: admission to Honors Program. Directed reading, reporting and discussion on the major materials of historical and contemporary relevance in the fields of American government and public administration.

GVPT 391H (151H). HONORS SEMINAR IN COMPARATIVE GOVERNMENT AND INTERNATIONAL RELATIONS. (3)
Prerequisite: admission to Honors Program. Directed reading, reporting and discussion centering on the major materials of historical and contemporary relevance in the fields of comparative government and international relations.

GVPT 392H (152H). HONORS SEMINAR IN PUBLIC LAW AND POLITICAL THEORY. (3)
Prerequisite: admission to Honors Program. Directed reading, reporting and discussion centering on the major materials of historical and contemporary relevance in the fields of public law and political theory.

GVPT 393H (153H). HONORS SEMINAR IN PUBLIC POLICY, POLITICAL BEHAVIOR AND METHODOLOGY. (3)
Prerequisite: admission to Honors Program. Directed reading, reporting and discussion centering on the major materials of historical and contemporary relevance in the fields of public policy and political behavior.

GVPT 397H (155H). HONORS RESEARCH. (3)
Prerequisite: admission to Honors Program. Individual and research. In his last semester each student prepares an original research paper.

GVPT 398H (156H). CURRENT LITERATURE IN GOVERNMENT AND POLITICS. (1)
Each student is assigned designated journals in consultation with the instructor. He prepares and distributes to his colleagues abstracts of selected articles, answers questions on the abstracts, and reports orally, in turn, on one or more articles of his choice.

GVPT 399 (199). SEMINAR IN GOVERNMENT AND POLITICS. (3)
Reading, research, discussion, analysis, and writing in the area of politics. Both substantive issues and methodological approaches will be considered. Primarily for government and politics undergraduate majors. Not open to graduate students.

GVPT 401 (154). PROBLEMS OF WORLD POLITICS. (3)
Prerequisite: GVPT 170. A study of governmental problems of international scope, such as causes of war, problems of neutrality, and propaganda. Students are required to report on readings from current literature.

GVPT 402 (102). INTERNATIONAL LAW. (3)
Prerequisite: GVPT 170. A study of the basic character, general principles and specific rules of international law, with emphasis on recent and contemporary trends in the field and its relation to other aspects of international affairs.

GVPT 403 (108). INTERNATIONAL ORGANIZATION. (3)
Prerequisite: GVPT 170. A study of the objectives, structure functions, and procedures of international organizations, including the United Nations and such functional and regional organizations as the Organization of American States.

GVPT 410 (110). PRINCIPLES OF PUBLIC ADMINISTRATION. (3)
Prerequisite: GVPT 170. A study of public administration in the United States giving special attention to the principles of organization and management and to fiscal, personnel, planning, and public relations practices.

GVPT 411 (111). PUBLIC PERSONNEL ADMINISTRATION. (3)
Prerequisite: GVPT 410 or BSAD 360. A survey of public personnel administration, including the development of merit civil service, the personnel agency, classification, recruitment, examination techniques, promotion, service ratings, training, discipline, employee relations, and retirement.

GVPT 412 (112). PUBLIC FINANCIAL ADMINISTRATION. (3)
Prerequisite: GVPT 410 or ECON 450. A survey of governmental financial procedures, including processes of current and capital budgeting, the administration of public borrowing, the techniques of public purchasing, and the machinery of control through pre-audit and post-audit.

GVPT 413 (113). GOVERNMENTAL ORGANIZATION AND MANAGEMENT. (3)
Prerequisite: GVPT 410. A study of the theories of organization and management in American government with emphasis on new trends, experiments and reorganizations.

GVPT 414 (181). ADMINISTRATIVE LAW. (3)
Prerequisite: GVPT 170. A study of the discretion exercised by administrative agencies, including analysis of their functions, their powers over persons and property, their procedures, and judicial sanctions and controls.

GVPT 417 (185). COMPARATIVE STUDY OF PUBLIC ADMINISTRATION. (3)
Prerequisite: GVPT 280 or 410, or consent of instructor. An introduction to the study of governmental administrative systems viewed from the standpoint of comparative typologies and theoretical schemes useful in cross-national comparisons and empirical studies of the politics of the administrative process in several nations. Both Western and Nonwestern countries are included.

GVPT 422 (122). QUANTITATIVE POLITICAL ANALYSIS. (3)
Prerequisite: GVPT 220, or consent of instructor. Introduction to quantitative methods of data analysis, including selected statistical methods, bloc analysis, content analysis, and scale construction.

GVPT 426 (178). PUBLIC OPINION. (3)
Prerequisite: GVPT 170. An examination of public opinion and its effect on political action, with emphasis on opinion formation and measurement, propaganda and pressure groups.

GVPT 427 (127). POLITICAL SOCIOLOGY. (3)
Prerequisite: GVPT 220, or consent of instructor. A study of the societal aspects of political life including selected aspects of the sociology of group formation and group dynamics, political association, community integration and political behavior presented in the context of the societal environments of political systems.

GVPT 429 (120). PROBLEMS IN POLITICAL BEHAVIOR. (3)
Prerequisite: GVPT 170. The problem approach to political behavior with emphasis on theoretical and empirical studies on selected aspects of the political process.

GVPT 431 (131). INTRODUCTION TO CONSTITUTIONAL LAW. (3)
Prerequisite: GVPT 170. A systematic inquiry into the general principles of the American constitutional system, with special reference to the role of the judiciary in the interpretation and enforcement of the federal constitution.

GVPT 432 (132). CIVIL RIGHTS AND THE CONSTITUTION. (3)
Prerequisite: GVPT 431. A study of civil rights in the American constitutional context, emphasizing freedom of religion, freedom of expression, minority discrimination, and the rights of defendants.

GVPT 433 (133). THE JUDICIAL PROCESS. (3)
Prerequisite: GVPT 170. An examination of judicial organization in the United States at all levels of government, with some emphasis on legal reasoning, legal research and court procedures.

GVPT 434 (134). RACE RELATIONS AND PUBLIC LAW. (3)
Prerequisite. GVPT 170. A political and legal examination of the constitutionally protected rights affecting racial minorities and of the constitutional power of the Federal Courts, Congress, and the Executive to define, protect and extend these rights.

GVPT 441 (141). HISTORY OF POLITICAL THEORY: ANCIENT AND MEDIEVAL. (3)
Prerequisite: GVPT 170. A survey of the principal political theories set forth in the works of writers before Machlavelli.

GVPT 442 (142). HISTORY OF POLITICAL THEORY: MODERN AND RECENT. (3)
Prerequisite. GVPT 170. A survey of the principal political theories set forth in the works of writers from Machlavelli to J. S. Mill.

GVPT 443 (143). CONTEMPORARY POLITICAL THEORY. (3)
Prerequisite: GVPT 441 or 442. A survey of the principal political theories and ideologies from Karl Marx to the present.

GVPT 444 (144). AMERICAN POLITICAL THEORY. (3)
Prerequisite: GVPT 170. A study of the development and growth of American political concepts from the colonial period to the present.

GVPT 445 (145). RUSSIAN POLITICAL THOUGHT. (3)
Prerequisite: GVPT 170. A survey and analysis of political ideas in Russia and the Soviet Union from early times to the present.

GVPT 450 (189). COMPARATIVE STUDY OF FOREIGN POLICY FORMATION. (3)
Prerequisite: GVPT 280 or 300, or consent of instructor. An introduction to the comparative study of foreign policy formation structures and processes followed by a survey of the domestic sources of policy for major states. A conspectus of substantive patterns of foreign policy in analytically salient types of systems is presented. Domestic and global systemic sources of foreign policy are compared.

GVPT 451 (109). FOREIGN POLICY OF THE U.S.S.R. (3)
Prerequisite: GVPT 170. A study of the development of the foreign policy of the Soviet Union, with attention paid to the forces and conditions that make for continuities and changes from Tsarist policies.

GVPT 452 (104). INTER-AMERICAN RELATIONS. (3)
Prerequisite: GVPT 170. An analytical and historical study of the Latin-American policies of the United States and of problems in our relations with individual countries, with emphasis on recent developments.

GVPT 453 (105). RECENT FAR EASTERN POLITICS. (3)
Prerequisite: GVPT 170. The background and interpretation of recent political events in the Far East and their influence on world politics.

GVPT 454 (103). CONTEMPORARY AFRICAN POLITICS. (3)
Prerequisite: GVPT 170. A survey of contemporary development in the international politics of Africa, with special emphasis on the role of an emerging Africa in world affairs.

GVPT 455 (107). CONTEMPORARY MIDDLE EASTERN POLITICS. (3)
Prerequisite: GVPT 170. A survey of contemporary development in the international politics of the Middle East, with special emphasis on the role of emerging Middle East nations in world affairs.

GVPT 457 (106). AMERICAN FOREIGN RELATIONS. (3)
Prerequisite: GVPT 170. The principles and machinery of the conduct of American foreign relations, with emphasis on the Department of State and the Foreign Service, and an analysis of the major foreign policies of the United States.

GVPT 460 (160). STATE AND LOCAL ADMINISTRATION. (3)
Prerequisite: GVPT 170. A study of the administrative structure, procedures and policies of state and local governments with special emphasis on the state level and on intergovernmental relationships, and with illustrations from Maryland governmental arrangements.

GVPT 461 (161). METROPOLITAN ADMINISTRATION. (3)
Prerequisite: GVPT 170. An examination of administrative problems relating to public services, planning and coordination in a metropolitan environment.

GVPT 462 (162). URBAN POLITICS. (3)
Urban political process and institutions considered in the light of changing social and economic conditions.

GVPT 473 (124). LEGISLATURES AND LEGISLATION. (3)
Prerequisite: GVPT 170. A comprehensive study of legislative organization procedure and problems. The course includes opportunities for student contact with Congress and with the Legislature of Maryland.

GVPT 474 (174). POLITICAL PARTIES. (3)
Prerequisite: GVPT 170. A descriptive and analytical examination of American political parties, nominations, elections, and political leadership.

GVPT 475 (175). THE PRESIDENCY AND THE EXECUTIVE BRANCH. (3)
Prerequisite: GVPT 170. An examination of the executive, legislative and party roles of the president in the political process.

GVPT 479 (171). PROBLEMS OF AMERICAN PUBLIC POLICY. (3)
Prerequisite: GVPT 170. The background and interpretation of various factors which affect the formation and execution of American public policy.

GVPT 480 (197). COMPARATIVE POLITICAL SYSTEMS. (3)
Prerequisite: GVPT 280 and at least one other course in comparative government. A study, along functional lines, of major political institutions, such as legislatures, executives, courts, bureaucracies, public organizations, and political parties.

GVPT 481 (191). GOVERNMENT AND ADMINISTRATION OF THE SOVIET UNION. (3)
Prerequisite: GVPT 170. A study of the adoption of the communist philosophy by the Soviet Union, of its governmental structure and of the administration of government policy in the Soviet Union.

GVPT 482 (192). GOVERNMENT AND POLITICS OF LATIN AMERICA. (3)
Prerequisite: GVPT 170. A comparative study of the governmental systems and political processes of the Latin American countries, with special emphasis on Argentina, Brazil, Chile, and Mexico.

GVPT 483 (193). GOVERNMENT AND POLITICS OF ASIA. (3)
Prerequisite: GVPT 280, or GVPT 453, or HIST 261, or HIST 262 or HIFN 442,, or HIFN 443, or HIFN 445. A comparative study of the political systems of China, Japan, India and other selected Asian countries.

GVPT 484 (194). GOVERNMENT AND POLITICS OF AFRICA. (3)
Prerequisite: GVPT 170. A comparative study of the governmental systems and political processes of the African countries, with special emphasis on the problems of nation-building in emergent countries.

GVPT 485 (195). GOVERNMENT AND POLITICS OF THE MIDDLE EAST. (3)
Prerequisite: GVPT 170. A comparative study of the governmental systems and political processes of the Middle Eastern countries, with special emphasis on the problems of nation-building in emergent countries.

GVPT 486 (190). COMPARATIVE STUDIES IN EUROPEAN POLITICS. (3)
Prerequisite: GVPT 280, or consent of instructor. A comparative study of political processes and governmental forms in selected European countries.

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

GVPT 700 (226). SCOPE AND METHOD OF POLITICAL SCIENCE. (3)

GVPT 702 (280). SEMINAR IN INTERNATIONAL RELATIONS THEORY. (3)

GVPT 780 (290). SEMINAR IN THE COMPARATIVE STUDY OF POLITICS. (3)

GVPT 799 (399). THESIS RESEARCH. (Arranged)

GVPT 802 (202). SEMINAR IN INTERNATIONAL LAW. (3)

GVPT 803 (201). SEMINAR IN INTERNATIONAL POLITICAL ORGANIZATIONS. (3)

GVPT 805 (209). SEMINAR IN INTERNATIONAL ADMINISTRATION. (3)

GVPT 807 (203). FUNCTIONAL PROBLEMS IN INTERNATIONAL RELATIONS: COMPARATIVE SYSTEMS. (3)

GVPT 808 (203). FUNCTIONAL PROBLEMS IN INTERNATIONAL RELATIONS: SELECTED TOPICS. (3)

GVPT 810 (210). GOVERNMENTAL ORGANIZATION THEORY. (3)

GVPT 811 (259). RESPONSIBILITY IN PUBLIC ADMINISTRATION. (3)

GVPT 812 (212). SEMINAR IN PUBLIC FINANCIAL ADMINISTRATION. (3)

GVPT 813 (214). PROBLEMS OF PUBLIC PERSONNEL ADMINISTRATION. (3)

GVPT 814 (217). DEVELOPMENTAL PUBLIC ADMINISTRATION. (3)

GVPT 815 (216). GOVERNMENT ADMINISTRATIVE PLANNING AND MANAGEMENT. (3)

GVPT 816 (219). STUDIES IN COMPARATIVE GOVERNMENTAL ADMINISTRATION. (3)

GVPT 818 (213). PROBLEMS OF PUBLIC ADMINISTRATION. (3)

GVPT 822 (228). PROBLEMS IN QUANTITATIVE POLITICAL ANALYSIS. (3)

GVPT 826 (221). SEMINAR IN PUBLIC OPINION. (3)

GVPT 828 (222). SELECTED PROBLEMS IN POLITICAL BEHAVIOR. (3)

GVPT 830 (231). SEMINAR IN PUBLIC LAW. (3)

GVPT 840 (247). ANALYTICAL SYSTEMS AND THEORY CONSTRUCTION. (3)

GVPT 841 (241). GREAT POLITICAL THINKERS. (3)

GVPT 842 (242). MAN AND THE STATE. (3)

GVPT 844 (244). AMERICAN POLITICAL THEORY. (3)

GVPT 845 (248). MARXIST POLITICAL THEORY. (3)

GVPT 846 (246). THEORIES OF DEMOCRACY. (3)

GVPT 847 (245). SEMINAR IN NON-WESTERN POLITICAL THEORY. (3)

GVPT 848 (243). CURRENT PROBLEMS IN POLITICAL THEORY. (3)

GVPT 851 (204). AREA PROBLEMS IN INTERNATIONAL RELATIONS: SOVIET UNION. (3)

GVPT 852 (204). AREA PROBLEMS IN INTERNATIONAL RELATIONS: LATIN AMERICA. (3)

GVPT 853 (204). AREA PROBLEMS IN INTERNATIONAL RELATIONS: ASIA. (3)

GVPT 854 (204). AREA PROBLEMS IN INTERNATIONAL RELATIONS: AFRICA. (3)

GVPT 855 (204). AREA PROBLEMS IN INTERNATIONAL RELATIONS: MIDDLE EAST. (3)

GVPT 856 (204). AREA PROBLEMS IN INTERNATIONAL RELATIONS: EUROPE. (3)

GVPT 857 (206). SEMINAR IN AMERICAN FOREIGN RELATIONS. (3)

GVPT 858 (204). AREA PROBLEMS IN INTERNATIONAL RELATIONS: SELECTED TOPICS. (3)

GVPT 862 (262). SEMINAR IN INTERGOVERNMENTAL RELATIONS. (3)

GVPT 868 (215). PROBLEMS OF STATE AND LOCAL GOVERNMENT. (3)

GVPT 869 (218). SEMINAR IN URBAN ADMINISTRATION. (3)

GVPT 870 (205). SEMINAR IN AMERICAN POLITICAL INSTITUTIONS. (3)

GVPT 873 (223). SEMINAR IN LEGISLATURES AND LEGISLATION. (3)

GVPT 874 (224). SEMINAR IN POLITICAL PARTIES AND POLITICS. (3)

GVPT 876 (200). SEMINAR IN NATIONAL SECURITY POLICY. (3)

GVPT 878 (261). PROBLEMS IN AMERICAN GOVERNMENT AND POLITICS. (3)

GVPT 881 (207). COMPARATIVE GOVERNMENTAL INSTITUTIONS: SOVIET UNION. (3)

GVPT 882 (207). COMPARATIVE GOVERNMENTAL INSTITUTIONS: LATIN AMERICA. (3)

GVPT 883 (207). COMPARATIVE GOVERNMENTAL INSTITUTIONS: ASIA. (3)

GVPT 884 (207). COMPARATIVE GOVERNMENTAL INSTITUTIONS: AFRICA. (3)

GVPT 885 (207). COMPARATIVE GOVERNMENTAL INSTITUTIONS: MIDDLE EAST. (3)

GVPT 886 (207). COMPARATIVE GOVERNMENTAL INSTITUTIONS. EUROPE. (3)
GVPT 887 (208). SEMINAR IN THE POLITICS OF DEVELOPING NATIONS. (3)
GVPT 888 (207). COMPARATIVE GOVERNMENTAL INSTITUTIONS. SELECTED TOPICS. (3)
GVPT 898 (398). READINGS IN GOVERNMENT AND POLITICS. (3)
GVPT 899 (499). DISSERTATION RESEARCH. (Arranged)

INFORMATION SYSTEMS MANAGEMENT

The program of studies in information systems management is designed to meet the needs of those wishing to concentrate on the application of the digital computer to the analysis, design and administration of complex information systems. Students who expect to enter business administration, public administration or organizations in other fields will find that this program offers a relevant preparation.

The student entering this program will place emphasis on the study of digital computer applications and relevant mathematical methods. With the aid of a faculty advisor, he will select a minimum of 15 hours of course work in a secondary field such as business administration, computer science, economics, mathematics, psychology, public administration, or the sciences.

INFORMATION SYSTEMS MANAGEMENT CURRICULUM

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition	3	
ENGL 201 (or 211 or 212 or 221 or 222)—Literature		3
MATH 140, 141—Analysis I, II	4	4
SPCH 100—Public Speaking	3	
Fine Arts and Philosophy Elective		3
Science (one biological and one physical)	3-4	3-4
HLTH 105—Science and Theory of Health		2
Physical Education	1	1
Elective	3	
	17-18	16-17
Sophomore Year		
BSAD 220, 221—Principles of Accounting	3	3
ECON 201, 203—Principles of Economics	3	3
ENGL 202 (or 211 or 212 or 221 or 222)—Literature	3	
PSYCH 100—Introduction to Psychology		3
*MATH240 —Linear Algebra	4	
CMSC 103 or 110—Introductory Algorithmic Methods or Elementary Algorithmic Analysis		3
History	3	3
	16	15
Junior Year		
IFSM 401—Electronic Data Processing	3	
IFSM 402—Electronic Data Processing Applications		3
IFSM 434—Operations Research I	3	
BSAD 434—Operations Research II		3
BSAD 230, 330—Business Statistics I, II	3	3
ECON 401, 403, 430, or 440 (any two)	3	3
Secondary Field	3	3
	15	15
Senior Year		
IFSM 410—Information Processing Problems of Models of Administrative, Economic, and Political Systems	3	
IFSM 436—Introduction to Systems Analysis		3
IFSM 420—Information Processing and Computational Problems in Operations Analysis		3
BSAD 432—Statistical Analysis and Forecasting	3	
Secondary Field	6	3
Electives	3	6
	15	15

*May be used for upper division credit.

FACULTY

Professor: Patrick.
Associate Profesor: Courtright.
Assistant Professor: Sprague.
Instructors: Akman, Chappell, Hartness.
Lecturer: Golding.

IFSM 401 (101). ELECTRONIC DATA PROCESSING. (3)
Prerequisites: junior standing, MATH 111 or the equivalent. The electronic digital computer and its use as a tool in processing data. The course includes the following areas: (1) Organization of data processing systems, (2) environmental aspects of computer systems, (3) management control problems and potentials inherent in mechanized data processing systems.

IFSM 402 (102). ELECTRONIC DATA PROCESSING APPLICATIONS. (3)
Prerequisites: IFSM 401 and BSAD 230, or consent of instructor. Intensive study of computer applications using a problem-oriented language. Introduction of computer methods for the solution of organizational problems. Laboratory exercises in programming and development of computer techniques.

IFSM 410 (110). INFORMATION PROCESSING PROBLEMS OF MODELS OF ADMINISTRATIVE, ECONOMIC AND POLITICAL SYSTEMS. (3)
Prerequisites: MATH 141 or equivalent; IFSM 402, BSAD 230, and some familiarity with administrative, economic and/or political models. Prerequisites may be waived with the consent of instructor. Data processing requirements underlying the creation and maintenance of a data base to be used in estimating the parameters of socio-economic models. An analysis of the structure and development of recent socio-economic models as relevant to data processing considerations. Extractions and preparation of data from the data base to facilitate the appropriate transformation necessary for model construction and also to minimize the processing cost of data input. The course draws upon a knowledge of models of administrative, economic and political systems. Case studies and experience with data processing for selected models are included.

IFSM 420 (120). INFORMATION PROCESSING AND COMPUTATIONAL PROBLEMS IN OPERATIONS ANALYSIS. (3)
Prerequisites: MATH 141 or equivalent; IFSM 402, and a course in Statistics, such as BSAD 432, dealing with multivariate models. Prerequisites may be waived with the consent of the instructor. Implementation of applications requiring the integration of data processing and analytical programming techniques. Such applications feature the calculation of various statistical estimates of the parameters in a multivariate model within the context of a file maintenance problem (e.g., the writing of a matrix inversion routine for revenue forecasting within a master updating program or sales forecasting and or sales performance evaluation within a sales transaction—master updating program). A universal, problem-oriented language such as COBAL will be used with strong emphasis on the use of the mathematical FORT IV library subroutines. Class projects include case studies and solutions of problems using real-world data.

IFSM 434 (136). OPERATIONS RESEARCH I. (3)
To meet this course requirement, all students enrolled in the Information Systems Management Curriculum will register in BSAD 332. For detailed information on pre-

requisites and description of the course refer to BSAD 332.

IFSM 436 (103). INTRODUCTION TO SYSTEMS ANALYSIS. (3)

Prerequisites: IFSM 402, BSAD 330, MATH 141, or the equivalent. Prerequisites may be waived with consent of instructor. The use of the computer in the management and operation of organizations. The course includes the following areas: (1) the principles of systems analysis, (2) recent applications and innovations of the systems concept, (3) design and implementation of computer systems, including such techniques as mathematical programming, stimulation, business games and network analysis, and (4) laboratory use of a digital computer in the application of these techniques.

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

IFSM 610 (210). DESIGN OF LARGE-SCALE INFORMATION SYSTEMS. (3)

IFSM 620 (220). MANAGEMENT OF INFORMATION PROCESSING SYSTEMS. (3)

IFSM 630 (230). APPLICATIONS OF ADVANCED DEVELOPMENTS IN INFORMATION PROCESSING EQUIPMENT. (3)

JOURNALISM

The Department of Journalism at the University of Maryland stands at the doorstep of the nation's capital and the world's news center. It is an ideal location for the study of journalism, public relations, and mass communications because many of the world's important journalists, great news events, and significant communications activities are near at hand.

The department is within easy reach of four of the nation's top 20 newspapers: the *Baltimore Sun,* the *Washington Post,* the *Washington Evening Star,* and the production offices of the *Wall Street Journal.* The department also has easy access to the Washington press corps—the large bureaus of the Associated Press, United Press International, *New York Times,* and many other American and foreign newspapers; also major networks and broadcasting news bureaus such as NBC, CBS, and ABC; also news, business, and special interest magazines, and representatives of the book publishing industry.

The department is close to the sources of news, including the White House, executive departments and agencies, Supreme Court, and Congress. It is near many major non-governmental representative bodies such as associations, scientific and professional organizations, foreign representatives, and international agencies.

The department has six primary objectives: 1) to insure a liberal education for journalists and mass communicators; 2) to provide professional development, including training in skills and techniques necessary for effective communication; 3) to increase public understanding of journalism and mass communication; 4) to advance knowledge through research and publication; 5) to raise the quality of journalism through critical examination and study; and 6) to provide continuing relationship with professional journalists and their societies.

The department's curriculum in news editorial journalism is accredited by The American Council on Education for Journalism. The department is a member of The American Asociation of Schools and Departments of Journalism, The Association for Education in Journalism, and The American Society of Journalism School Administrators.

Student journalism organization chapters include Sigma Delta Chi, Theta Sigma Phi, Pi Delta Epsilon, Kappa Tau Alpha, Kappa Alpha Mu, and a charter chapter of the Public Relations Student Society of America.

The department offers specialized work in news reporting.

REQUIREMENTS FOR THE JOURNALISM MAJOR

Listed below are lower-division and upper-division requirements for majors in the Department of Journalism. In qualifying for the degree, the student must complete 120 semester hours, 57 hours of which must be upper-division credit.

Course substitutions may be made by the faculty advisor to take account of previous professional experience and to develop programs to include special study. Within the broad outlines of the upper-division courses themselves, students are encouraged to develop individual interest by careful choice of elective courses.

Lower-Division Curriculum

Freshman Year	Semester I	Semester II
ENGL 101 (or 171) and 201	3	3
Science (one course of which must be lab)	4	3
Foreign Language	3	3
PSYC 100 and SOCY 100	3	3
SPCH 100	3	
MATH 110		3
HLTH 105*		2
Physical Activities*	1	1
Total	17	18

*The required HLTH 105 and PHED credits are not applied to the minimum of 120 needed for graduation.

Sophomore Year	Semester I	Semester II
JOUR 200 and JOUR 201	3	3
ENGL 202	3	
Foreign Language	3	3
History	3	3
GVPT 170 and ECON 205	3	3
Fine Arts (elected from PHIL 100, 170, 140, 236; ARTH 100, 260, 261, 284, 320, 321, 330, 331, 340, 341; DART 110; MUSC 130)		3
Total	15	15

Upper-Division Curriculum

Journalism Requirements

24 credit hours in upper division journalism courses, including Journalism 310, News Editing. At least six credit hours should be taken in one of the following areas for depth in a special field of journalism:

JOUR 320 and 321—News Reporting.
JOUR 330 and 331—Public Relations.
JOUR 340 and 341—Advertising.
JOUR 350 and 351—News Photography.
JOUR 360 and 361—News Broadcasting.

All journalism majors should elect at least six credit hours from the following courses for breadth in mass communication:

JOUR 400—Law of Mass Communication.
JOUR 410—History of Mass Comunication.
JOUR 420—Government and Mass Communication.
JOUR 430—Comparative Mass Communication Systems.
JOUR 440—Public Opinion and Mass Communication.

Non-Journalism Requirements

12-18 credit hours in upper-division courses in one subject outside of the Journalism Department.

12-18 credit hours of upper-division, non-journalism electives, to be spread or concentrated according to individual needs.

Minimum upper-division credits for graduation 57
Total Lower and Upper-Division 120*

Professor and Department Chairman: Hiebert.
Professors: Bryan, Crowell, Martin, Newsom.
Assistant Professors: Brown, Flippen, Grunig, Medura, Petrick.
Lecturers: Geraci, Lee.

JOUR 200 (010). INTRODUCTION TO MASS COMMUNICATION. (3)
Survey of the process and effects of mass communication; historical development and social, economic, legal, and professional aspects of the mass media. Open to all students.

JOUR 201 (011). WRITING FOR THE MASS MEDIA. (3)
Introduction to news, feature and publicity writing for the printed and electronic media; development of news concepts; laboratory in news gathering tools and writing skills. Prerequisite: typing ability and JOUR 200 (which may be taken concurrently, with permission).

JOUR 310 (160). NEWS EDITING. (3)
Principles of the editing process and practice in copy editing, headline writing, newspaper page layout, and editorial judgment. Prerequisites: JOUR 200 and 201.

JOUR 320 (100). NEWS REPORTING. (3)
Principles and practices of news reporting, with special emphasis on news gathering for all the media; covering news beats and other news sources, including researching a news story for accuracy, comprehensiveness and interpretation. Prerequisites: JOUR 200 and 201.

JOUR 321 (175). REPORTING OF PUBLIC AFFAIRS. (3)
Adanced training in writing news for publication in specialized areas, particularly city, county, and federal news. Students meet in seminar with news sources and leading news reporters and work in Washington, D. C., Annapolis, and Baltimore in covering news in depth for publication. Prerequisites: JOUR 320 and permission of the instructor.

JOUR 330 (166). PUBLIC RELATIONS. (3)
Study of the principles and historical development of public relations. Attention is given to fact-finding, planning, communication, and evaluation aspects of public relations. Study of the use of public relations in business, government, associations, and organizations. Prerequisites: JOUR 200 and 201.

JOUR 331 (170). PRINCIPLES OF PUBLICITY. (3)
Study of the strategy and techniques of purposive communication; analysis of the techniques and effects of the publicity campaign; laboratory in special publicity projects. Prerequisite: JOUR 330.

JOUR 340 (163). PRINCIPLES OF TYPOGRAPHY AND PRODUCTION. (3)
Study of layout, typography. design, and printing in the planning and production of the printed media. Prerequisites: JOUR 200 and 201.

JOUR 341 (152). ADVERTISING COPY AND LAYOUT. (3)
Theory and practice in advertising copy and layout, with emphasis on newspaper advertising, for letterpress and photo-offset printing. Use of illustrations, type selection, copy-fitting, media selection. Prerequisites: JOUR 200 and 201.

JOUR 350 (181). NEWS PHOTOGRAPHY. (3)
Fundamentals of shooting, developing and printing of news and feature pictures for all media. Department furnishes equipment and student furnishes supplies. Prerequisites: JOUR 200 and 201.

JOUR 351 (182). ADVANCED NEWS PHOTOGRAPHY. (3)
Advanced training in shooting, developing, and printing pictures, with emphasis on the photo story. Analysis of the role of photography in mass communication. Department furnishes equipment and student furnishes supplies. Prerequisite: JOUR 350.

JOUR 360 (101). BROADCAST NEWS WRITING. (3)
Study of and practice in the special application of news writing and editing to the broadcasting media, including the use of wire copy and tape recorders in producing newscasts. Prerequisites: JOUR 320 and 321.

JOUR 361 (184). REPORTING THROUGH AUDIO-VISUAL MEDIA. (3)
Principles of live photography and recording in the production of news and documentaries for all the media. Prerequisites: JOUR 350 and 360.

JOUR 370 (171). INDUSTRIAL JOURNALISM. (3)
Industrial communications, management and production of company periodicals, public relations aspects of industrial journalism. Prerequisites: JOUR 200 and 201.

JOUR 371 (165). MAGAZINE ARTICLE AND FEATURE WRITING. (3)
Study of types of feature articles, particularly for the magazine market, analysis of the magazine medium and specialized audiences; practice in researching and writing the feature article; analysis of free-lance markets. Prerequisites: JOUR 200 and 201.

JOUR 380 (174). JOURNALISM OF SCIENCE AND TECHNOLOGY. (3)
Study and practice of the basic techniques of writing and editing scientific and technical material for both the general audience and the specialist. Prerequisites: JOUR 200 and 201.

JOUR 400 (191). LAW OF MASS COMMUNICATION. (3)
Study of the legal rights and constraints of mass media; libel, privacy, copyright, monopoly, and contempt, and other aspects of the law applied to mass communication. Previous study of the law not required. Prerequisites: JOUR 200 and 201.

JOUR 410 (192). HISTORY OF MASS COMMUNICATION. (3)
Study of the development of newspapers, magazines, radio, television, and motion pictures as media of mass communication. Analysis of the influences of the media on the historical development of America. Prerequisites: JOUR 200 and 201.

JOUR 420 (186). GOVERNMENT AND MASS COMMUNICATION. (3)
Study of the relationship between the news media and government. Analysis of media coverage of government and politics. Study of governmental and political information and persuasion techniques. Prerequisites: JOUR 200 and 201.

JOUR 430 (176). COMPARATIVE MASS COMMUNICATION SYSTEMS. (3)
Survey of the history and status of the mass media throughout the world; comparative analysis of the role of the press in different societies. Prerequisites: JOUR 200 and 201 or consent of the instructor for non-majors.

JOUR 440 (194). PUBLIC OPINION AND MASS COMMUNICATION. (3)
The role and responsibilities of the mass media in the formation of public opinion; research methods and cases in the use of propaganda, advertising, public relations and education through mass communication in the service of governments, public and private organizations and individuals. Prerequisites: JOUR 200 and 201.

JOUR 490 (161). SEMINAR IN JOURNALISM. (3)
Seminar for journalism seniors in newsroom problems and policies, emphasizing ethics and responsibilities; in cooperation with the Baltimore Sun, Baltimore News-American, and other area news media. Prerequisite: Permission of the instructor.

JOUR 496 (196). PROBLEMS IN JOURNALISM. (1-2)
Group and individual projects in problems in journalism. Prerequisites: JOUR 200 and 201.

JOUR 497 (197S). SUPERVISED INTERNSHIP. (0)
Summer session. To be taken following junior year as major in this department, permission of Instructor. Ten weeks of organized, supervised study, experience, on-the-job training in journalism.

FOR GRADUATES

See the *Graduate School catalog* for descriptions.

JOUR 600 (200). RESEARCH METHODS IN MASS COMMUNICATION. (3)
JOUR 610 (210). SEMINAR IN MASS MEDIA AND SOCIETY. (3)
JOUR 612 (212). THEORIES OF MASS COMMUNICATION. (3)
JOUR 620 (220). SEMINAR IN PUBLIC AFFAIRS REPORTING. (3)
JOUR 621 (221). INTERPRETATION OF CONTEMPORARY AFFAIRS. (3)
JOUR 630 (234). SEMINAR IN CORPORATE COMMUNICATION. (3)
JOUR 640 (235). MASS CULTURE AND MASS COMMUNICATION. (3)
JOUR 700 (240). SEMINAR IN MASS MEDIA LAW. (3)
JOUR 710 (241). SEMINAR IN MASS MEDIA HISTORY. (3)
JOUR 720 (230). SEMINAR IN GOVERNMENT AND MASS COMMUNICATION. (3)
JOUR 721 (231). SEMINAR IN URBAN MASS COMMUNICATION. (3)
JOUR 730 (251). SEMINAR IN COMPARATIVE MASS COMMUNICATION. (3)
JOUR 731 (250). CROSS-CULTURAL COMMUNICATION. (3)
JOUR 799 (399). THESIS RESEARCH. (3-6)
JOUR 800 (260). SEMINAR IN CRITICAL ANALYSIS. (3)
JOUR 810 (270). SPECIAL PROBLEMS IN COMMUNICATION. (3)
JOUR 812 (280). SEMINAR IN COMMUNICATION THEORIES. (3)

BUREAU OF GOVERNMENTAL RESEARCH

Activities of the Bureau of Governmental Research relate primarily to the problems of state and local government in Maryland. The bureau engages in research and publishes findings with reference to local, state and national governments and their interrelationships. It undertakes surveys and offers its assistance and service to units of government in Maryland and serves as a clearing house of information for them. The bureau furnishes opportunities for qualified students interested in research and career development in state and local administration.

Urban affairs have become a central focus with the establishment of an Urban Research Group, which draws on a variety of interdisciplinary faculty interests within the University.

The Maryland Technical Advisory Service, a division of the bureau, provides consulting services to county and municipal governments of the State. Technical consultation and assistance are provided on specific problems in such areas as preparation of charters and codes or ordinances, fiscal management, personnel management, utility and other service operations, planning and zoning, and related local or intergovernmental activities. The staff analyzes and shares with governmental officials information concerning professional developments and opportunities for new or improved programs and facilities.

BUREAU OF BUSINESS AND ECONOMIC RESEARCH

The functions of the Bureau of Business and Economic Research are research, training and public service.

The research activities of the bureau are primarily focused on basic research in the field of regional and urban studies. Although the Bureau's long-run research program is carried out largely by its own staff, faculty members from other departments also participate. The bureau also undertakes cooperative research contracts under the sponsorship of federal and state governmental agencies, research foundations and other groups.

The training functions of the bureau are achieved through active participation by advanced graduate and undergraduate students in the bureau's research program. This direct involvement of students in the research process under faculty supervision provides research skills that equip students for responsible posts in business, government and higher education.

The bureau observes its service responsibilities to government, business, and private groups primarily through the publication and distribution of its research findings. In addition, the bureau staff welcomes the opportunity to be of service to governmental, business and private groups by consulting with them on problems in business and economics, particularly those related to regional development.

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PIERCE, James Lee, Lecturer in Economics
B.A., University of California (Berkeley), 1959; Ph.D., 1964.

PIPER, Don C., Professor and Chairman of Government and Politics
B.A., University of Maryland, 1954; M.A., 1958; Ph.D., Duke University, 1961.

PLISCHKE, Elmer, Professor of Government and Politics
Ph.B., Marquette University, 1937; M.A., American University, 1938; Ph.D., Clark University, 1943.

POIST, Richard F., Lecturer in Business Administration
B.S., Pennsylvania State University, 1965; M.B.A., University of Maryland, 1967.

QUALLS, Paul David, Assistant Professor of Economics
B.A., University of Florida, 1960; M.A., 1961; Ph.D., University of California (Berkeley), 1968.

RANALD, Ralph A., Visiting Associate Professor of Government and Politics
A.B., University of California at Los Angeles, 1952; M.A., 1954; A.M., Princeton University, 1958; Ph.D., 1961.

REEVES, Marvis Mann, Lecturer in Government and Politics
B.A., West Virginia University, 1952; M.A., 1943; Ph.D., University of North Carolina, 1947.

RICE, E. Barry, Instructor in Business Administration
B.S., Virginia Polytechnic Institute, 1963; C.P.A.

RICHARDS, Carl T., County Management Associate, Maryland Technical Advisory Service, Bureau of Governmental Research
B.S., West Chester State College, 1962; M.A., University of Maryland, 1968.

ROSENTHAL, Lewis D., Lecturer in Geography
B.B.A. (accounting) City College, N.Y.C., 1943; M.A., (economics) N.Y.C., 1963.

ROUSE, John E., Jr., Research Assistant, Bureau of Governmental Research
B.A., Furman University, 1964; M.A., University of Maryland, 1967.

ROY, Raymond A., Instructor in Business Administration
B.S., Commerce, St. Mary's University, 1963; M.B.A., University of Massachusetts, 1964.

SCHILLER, Bradley R., Assistant Professor in Economics
A.B., University of California, 1965; Ph.D., Harvard University, 1969.

SCHINK, George R., Lecturer in Economics
B.A., University of Wisconsin, 1964.

SCHULTZE, Charles L., Professor of Economics
B.A., Georgetown University, 1948; M.A., 1950; Ph.D., University of Maryland, 1960.

SEBERT, Suzanne K., Lecturer in Government and Politics
B.A., University of Michigan, 1964; M.A., 1966.

SHIMP, Terence A., Instructor in Business Administration
A.B., West Liberty State College, 1968; M.B.A., University of Kentucky, 1969.

SHIPLEY, Jerry J., Lecturer in Economics
B.A., Grinnell College, 1961; M.A., Stanford University, 1963.

SINGER, Neil M., Assistant Professor of Economics
A.B., Harvard University, 1960; M.A., Stanford, 1961; Ph.D., 1965.

SKOK, James E., Municipal Management Associate, Maryland Technical Advisory Service, Bureau of Governmental Research
B.A., Pennsylvania State University, 1958; M.A., 1964.

SNOW, John W., Lecturer in Economics
B.A., University of Toledo, 1962; Ph.D., University of Virginia, 1965; J.D., George Washington Law School, 1967.

SOLOMON, Susan L., Lecturer in Business Administration
A.B., Radcliffe College, 1962; M.S., University of California, 1966.

SPENCER, Jean E., Assistant Professor of Government and Politics and Research Associate, Bureau of Governmental Research
B.A., University of Maryland, 1955; M.A., 1961; Ph.D., 1966.

SPIVEY, Clinton C., Associate Professor of Production Management
B.S., University of Illinois, 1946; M.S., 1947; Ph.D., 1957.

STONE, Clarence N., Associate Professor of Government and Politics, and Director, Urban Research Group and Maryland Technical Advisory Service, Bureau of Governmental Research
A.B., University of South Carolina, 1957; M.A., Duke University, 1960; Ph.D., 1963.

STROBER, Myra H., Assistant Professor of Economics
B.S., Cornell University, 1962; M.A., Tufts University, 1965; Ph.D., Massachusetts Institute of Technology, 1969.

STRAYHORN, Martha, Lecturer in Economics
B.A., Duke University, 1964; M.A., University of Wisconsin, 1968

STROUSE, James C., Assistant Professor of Government and Politics
B.A., University of Maryland, 1966; M.A., 1967; Ph.D., University of North Carolina at Chapel Hill, 1970.

TAFF, Charles A., Professor and Chairman of the Department of Business Administration
B.S., University of Iowa, 1937; M.A., 1941; Ph.D., University of Maryland, 1952.

TAYLOR, Graeme, Lecturer in Economics
B.S., University of St. Andrews (Scotland), 1960; M.B.A., Harvard University, 1962.

TERCHEK, Ronald J., Assistant Professor of Government and Politics
B.A., University of Chicago, 1958; M.A., 1960; Ph.D., University of Maryland, 1965.

THIEBLOT, Armand J., Jr., Assistant Professor of Business Administration
B.S., (Engineering) Princeton University, 1961; M.B.A., University of Pennsylvania, 1965; Ph.D., 1969.

THOMPSON, Daniel R., Municipal Management Associate—Law, Maryland Technical Advisory Service, Bureau of Governmental Research
B.A., Queens College, 1950; LL.B., Georgetown University, 1960.

THOMPSON, Derek, Assistant Professor of Geography
B.A., Manchester University, 1960; M.A., 1962; Ph.D., 1966.

TOBIN, Bernard F., Lecturer in Economics
B.A., University of British Columbia, 1930; M.A., University of Chicago, 1936.

TILTON, John E., Assistant Professor in Economics
A.B., Princeton University, 1961; M.A., Yale University, 1962; Ph.D., Yale University, 1965.

TOBIN, Bernard F., Lecturer in Economics
B.A., University of British Columbia, 1930; M.A., University of Chicago, 1936.

ULMER, Melville J., Professor of Economics
B.S., New York University, 1937; M.A., 1938; Ph.D., Columbia University, 1948.

WEBB, Ronald J., Instructor in Business Administration
B.A., Wheaton College, 1964; M.B.A., University of Maryland, 1966.

WEINSTEIN, Paul A., Associate Professor of Economics
B.A., College of William and Mary, 1954; M.A., Northwestern University, 1958; Ph.D., 1961.

WERLIN, Herbert H., Assistant Professor of Government and Politics
A.B., University of Chicago, 1953; B.A./M.A., Oxford University, 1955; M.A., Yale University, 1957; Ph.D., University of California (Berkeley), 1966.

WHITMAN, Ray D., Lecturer in Economics and Research Associate in Bureau of Business and Economic Research
B.S., Columbia University, 1964.

WIDHELM, William B., Assistant Professor of Management Science
B.E.S., The Johns Hopkins University, 1959; M.S.E., 1960; M.S.M.S., 1965; Ph.D., 1969.

WIDEL, Joseph W., Associate Professor of Geography
B.A., University of Maryland, 1958; M.A., University of Maryland, 1963.

WILKENFELD, Jonathan, Assistant Professor of Government and Politics
B.S., University of Maryland, 1964; M.A., George Washington University, 1966; Ph.D., Indiana University, 1969.

WOLFE, James H., Associate Professor of Government and Politics
B.A., Harvard University, 1955; M.A., University of Connecticut, 1958; Ph.D., University of Maryland, 1962.

WOLFF, Paul J., Instructor in Business Administration
B.B.A., University of Texas, 1956; M.B.A., Western Reserve University, 1959.

WONNACOTT, Paul, Professor of Economics
B.A., University of Western Ontario, 1955; M.A., Princeton University, 1957, Ph.D., 1959.

WRIGHT, Howard W., Professor of Accounting
B.S., Temple University, 1937; M.A., University of Iowa, 1940; C.P.A., Texas, 1940, Ph.D., University of Iowa, 1947.

YOSHIOKA, Gary A., Lecturer in Geography
B.S., Lafayette College, 1966.

ZABRISKIE, Noel B., Assistant Professor of Marketing
B.S., University of Illinois, 1959, M.S., 1962; Ph.D., 1968.

Education

THE COLLEGE OF EDUCATION meets the needs of the following classes of students: (1) persons preparing to teach in colleges, secondary schools, elementary schools, kindergarten and nursery schools; (2) persons preparing to teach classes in special education or to be school librarians; (3) present or prospective teachers who wish to supplement their preparation; (4) students preparing for educational work in the trades and industries; (5) graduate students preparing for teaching, supervisory, advanced specialist or administrative positions; (6) certain students whose major interests are in other fields, but who desire courses in education.

Because of the location of the University in the suburbs of the Nation's Capital, unusual facilities for the study of education are available to its students and faculty. The Library of Congress, the library of the United States Office of Education, and special libraries of other government agencies are accessible, as well as the information services of the National Education Association, American Council on Education, United States Office of Education, and other organizations, public and private. The school systems of the District of Columbia, Baltimore and the counties of Maryland offer generous cooperation.

The teacher education programs preparing early childhood, elementary school and secondary school teachers at the the bachelor's degree and master's degree levels, and the programs preparing school service personnel (elementary and secondary school principals, general school administrators, supervisors, curriculum coordinators, guidance counselors, student personnel administrators, and vocational rehabilitation counselors) at the master's, advanced graduate specialist and doctoral degree levels are all fully accredited by the National Council for Accreditation of Teacher Education.

ORGANIZATION

The College is organized into seven departments, an institute and other non-departmental areas. These offer a wide range of programs in teacher education or education specialties.

FACILITIES

The College is housed in two buildings. All departments and special areas with the exception of industrial education have their offices and instructional facilities in the College of Education Building. This building was planned with the special needs of teacher education in mind. The industrial education department is housed in the J. Milton Patterson Building. The facilities of this building are devoted exclusively to the work of that department.

GENERAL REQUIREMENTS FOR ADMISSION

In selecting students emphasis will be placed upon high marks and other indications of probable success in college rather than upon a fixed pat-

tern of subject matter. Of the 16 required units, four units of English and one unit of social sciences, natural sciences and mathematics are required. Additional units in mathematics, natural sciences and social sciences are desirable for a program that permits the greatest amount of flexibility in meeting the requirements of various College of Education curricula. A foreign language is desirable for certain programs. Fine arts, trade and vocational subjects are acceptable as electives. Every prospective applicant should be certain that his preparation in mathematics is adequate for any program that he might wish to enter.

Candidates for admission whose high school or college records are consistently low are strongly advised not to seek admission to the College of Education.

GUIDANCE IN REGISTRATION

At the time of matriculation each student is tentatively assigned to a member of the faculty who acts as the student's advisor. The choice of subject areas within which the student will prepare to teach will be made under faculty guidance during the freshman year. The student will confer regularly with the faculty member in the College of Education responsible for his teaching major. While it may be possible to make satisfactory adjustments as late as the junior year for students from other colleges who have not already entered upon the sequence of professional courses, it is highly desirable that the student begin his curriculum work in the freshman year. *Students who intend to teach* (except agriculture and physical education) *should register in the College of Education*, in order that they may have the continuous counsel and guidance of the faculty directly responsible for teacher education at the University of Maryland.

GENERAL REQUIREMENTS OF THE COLLEGE

Minimum requirements for graduation are 124 semester hours including the four semester hours in required physical education and health. Specific program requirements for more than the minimum must be fulfilled. In cases where the physical education and/or health requirements are waived academic electives should be taken to insure the minimum of 124 hours.

In addition to the University General Education Program and the specific requirements for each curriculum, the college requires a minimum of 20 hours of education courses and three (3) hours of speech.

Marks in all required upper division courses in education and in subjects in major and minor fields must be C or higher, except in the case of student teaching where a grade of P is required. A general average of C or higher must be maintained. (See Admission to Teacher Education.)

Exceptions to curricular requirements and rules of the College of Education must be recommended by the student's advisor and approved by the dean.

Students who are not enrolled in the College of Education but who are preparing to teach and wish to register in professional education courses required for certification must meet all curricular and scholastic requirements of the College of Education.

ADMISSION TO TEACHER EDUCATION

All students, full or part-time, who are in a teacher education curriculum, must apply to the Admission to Teacher Education Committee for admission to teacher education at the beginning of the semester immediately after earning 42 hours, excluding required physical education. Transfer students with 42 or more hours of acceptable transfer credit must apply at time of transfer. Transfer students must complete a minimum of 12 hours at Maryland before they can be admitted to Teacher Education. Post-graduate certification students must apply at the beginning of their program. Application forms may be obtained from the College of Education office, advisors or departmental offices.

In considering applications, the following criteria have been established by the committee:

1. No student will be allowed to enroll in EDUC. 110 and methods classes until he has received full approval, except those transfer students who transfer with 56 hours of acceptable credit.
2. Full approval is always granted with the understanding that the student must have a successful field experience in EDUC. 110, and that any case may be reconsidered by the committee if subsequent academic performance falls.
3. Secondary education applicants must show evidence of ability to achieve on an above average level in courses directly related to their major field.
4. Applicants must be of good moral and ethical character. This will be determined as fairly as possible from such evidence as advisors' recommendations and records of serious campus delinquencies.
5. Applicants must be physically and emotionally capable of functioning as teachers. This will mean freedom from serious chronic illness, emotional instability and communicable disease, as determined in cooperation with the Health Service and the Counseling Center.
6. Applicants must be free of serious speech handicaps.

The purpose of the screening procedure associated with admission to teacher education is to insure that graduates of the teacher education program will be well prepared for teaching and can be recommended for certification with confidence.

MAJORS AND MINORS

In the Early Childhood-Elementary curriculum, no major or minor is required, but students must

complete at least 80 hours of academic work which includes an area of concentration of at least 18 hours.

In secondary education, majors only are required (except in speech education), although minors may be developed in most programs if students desire them. Specific programs should be consulted for information concerning minors.

STUDENT TEACHING

In order to be admitted to a course in student teaching, a student must have been admitted to the Teacher Education Program (see above) and have a grade point average of 2.30, based on University of Maryland courses only, a physician's certificate indicating that the applicant is free of communicable diseases and the consent of the instructor in the appropriate area. Application must be made with the Coordinator of Laboratory Experiences by the middle of the semester which precedes the one in which student teaching will be done. Any applicant for student teaching must have been enrolled previously at the University of Maryland for at least one semester.

CERTIFICATION OF TEACHERS

The State Department of Education certifies to teach in the approved public schools of the state only graduates of approved colleges who have satisfactorily fulfilled subject-matter and professional requirements. The curricula of the College of Education fulfill State Department requirements for certification.

DEGREES

The degrees conferred upon students who have met the conditions prescribed for a degree in the College of Education are Bachelor of Arts and Bachelor of Science. Majors in English, languages, social sciences and speech receive the B.A. degree. Mathematics and art majors may receive either degree. All others receive the B.S. degree.

COURSE OFFERINGS
NON-DEPARTMENTAL AREAS

Nondepartmental areas offer programs which prepare students for certification and offer service for graduate majors. Included are school librarianship; history, philosophy and sociology of education and comparative education (social foundations of education); and some aspects of adult education.

EDUC 288 (088). SPECIAL PROBLEMS IN EDUCATION (1-6)
Prerequisites, consent of education advisor. Available only to freshmen and sophomore students who have definite plans for individual study of approved problems relative to their preparation for teaching. Course cards must have the title of the problem and the name of the faculty member who has approved it. (Staff)

EDUC 300 (110). HUMAN DEVELOPMENT AND LEARNING. (6)
Open only to students approved for teacher education. Studies scientific facts that describe growth, development, and learning and the implications of these for the teacher and the school. A study of an individual child and a classroom participation experience are integral parts of the course and require a one-half day per week assignment in a public school as a teacher aide. Students are scheduled for field assignments in an elementary or high school according to the curriculum they are in. Each group is under the supervision of a faculty member with whom it meets every second week in a seminar session. (Staff)

EDUC 301 (111). FOUNDATIONS OF EDUCATION. (3)
Prerequisites, EDUC 300, completion of at least 90 hours and approval for admission to teacher education. Historical, social, cultural, and philosophical foundations of American education. Considers education as a profession, and the organizational structure, operation and function of modern school systems. Comparative education and contemporary issues are included. (Staff)

For EDUC 370-375, see Library Science Education.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

EDUC 410 (100). HISTORY OF EDUCATION IN WESTERN CIVILIZATION. (3)
Educational institutions through the ancient, medieval and early modern periods in western civilization, as seen against a background of socio-economic development. (Lindsay, Male)

EDUC 411 (102). HISTORY OF EDUCATION IN THE UNITED STATES. (3)
A study of the origins and development of the chief features of the present system of education in the United States. (Finkelstein, Male, Wiggin)

EDUC 420 (107). PHILOSOPHY OF EDUCATION. (3)
A study of the great educational philosophers and systems of thought affecting the development of modern education. (Agre, Noll)

EDUC 421 (108). LOGIC OF TEACHING. (3)
An analysis of the structure of basic subject matters in the curriculum and of the standard logical moves in teaching. (Agre)

EDUC 430 (160). EDUCATIONAL SOCIOLOGY. (3)
Deals with data of the social sciences which are germane to the work of teachers. Implications of democratic ideology for educational endeavor, educational tasks imposed by changes in population and technological trends, the welfare status of pupils, the socio-economic attitudes of individuals who control the schools, and other elements of community background. (Huden)

EDUC 440 (147). AUDIO-VISUAL EDUCATION. (3)
First semester and summer session. Sensory impressions in their relation to learning projection apparatus, its cost and operation; slides, filmstrips and films, physical principles underlying projection; auditory aids to instruction; field trips; pictures, models and graphic materials; integration of sensory aids with organized instruction. Recommended for all education students. (Staff)

EDUC 442 (148). INSTRUCTIONAL MEDIA SERVICES. (3)
Prerequisites, teaching experience and EDUC 440, or equivalent. Procedures for coordinating instructional media programs; instructional materials acquisition, storage, scheduling, distribution, production, evaluation and other service responsibilities; instructional materials center staff coordination of research, curriculum improvement and faculty development programs. (Staff)

EDUC 444 (149). PROGRAMMED INSTRUCTION. (3)
Analysis of programmed instruction techniques; selection, utilization and evaluation of existing programs and teaching machines; developing learning objectives; writing and validating programs. (Staff)

EDUC 489 (187). FIELD EXPERIENCE IN EDUCATION. (1-4)
A. Adult Education
B. Social Foundations
C. Higher Education
Prerequisites, at least six semester hours in education at the University of Maryland plus such other prerequisites as may be set by the major area in which the experience is to be taken. Planned field experience may be provided for selected students who have had teaching experience and whose application for such field experience has been approved by the education faculty. Field experience is offered in a given area to both major and nonmajor students.
Note: The total number of credits which a student may earn in EDUC 489, EDUC 888, and EDUC 889 is limited to a maximum of twenty semester hours. (Staff)

EDUC 498 (188). SPECIAL PROBLEMS IN EDUCATION. (1-3)
Prerequisite, consent of instructor. Available only to mature students who have definite plans for individual study of approved problems. Course cards must have the title of the problem and the name of the faculty member who has approved it. (Staff)

EDUC 499 (189). WORKSHOPS, CLINICS AND INSTITUTES. (1-6)
The maximum number of credits that may be earned under this course symbol toward any degree is six semester hours; the symbol may be used two or more times until six semester hours have been reached. The following type of educational enterprise may be scheduled under this course heading: workshops conducted by the College of Education (or developed cooperatively with other colleges and universities) and not otherwise covered in the present course listing; clinical experiences in pupil-testing centers, reading clinics, speech therapy laboratories, and special education centers; institutes developed around specific topics or problems and intended for designated groups such as school superintendents, principals and supervisors. (Staff)

FOR GRADUATES

See Graduate School catalog for descriptions.

EDUC 620 (208). ANALYSIS OF EDUCATIONAL CONCEPTS. (3) (Agre)

EDUC 640 (232). SEMINAR IN EDUCATIONAL TECHNOLOGY RESEARCH AND THEORY. (3) (Staff)

EDUC 642 (230). MEDIATED INSTRUCTIONAL SYSTEMS. (3) (Staff)

EDUC 644 (231). PRACTICUM IN INSTRUCTIONAL SYSTEMS. (2-6) (Staff)

EDUC 660 (205). COMPARATIVE EDUCATION. (3) (Lindsay, Huden, Male)

EDUC 661 (213). INTERNATIONAL ORGANIZATIONS AND EDUCATIONAL CHANGE. (3) (Huden)

EDUC 670 (211). EDUCATION IN AFRICA. (3) (Hopkins)

EDUC 671 (212). EDUCATION IN THE NEAR EAST. (3) (Lindsay)

EDUC 709 (207). SEMINAR IN HISTORY AND PHILOSOPHY OF EDUCATION. (2) (Staff)

EDUC 730 (204). SEMINAR IN EDUCATIONAL SOCIOLOGY. (3) (Grambs)

EDUC 760 (206). SEMINAR IN COMPARATIVE EDUCATION. (3) (Huden, Lindsay, Male)

EDUC 798 (288). SPECIAL PROBLEMS IN EDUCATION. (1-6) (Staff)

EDUC 799 (399). THESIS RESEARCH. (Master's Level) (Staff)

EDUC 858 (209). ADULT EDUCATION. (3) (Wiggin)

EDUC 859 (279). SEMINAR IN ADULT EDUCATION. (3)

EDUC 888 (224). APPRENTICESHIP IN EDUCATION. (1-9)
A. Adult Education
B. Social Foundations (Staff)

EDUC 889 (287). INTERNSHIP IN EDUCATION. (3-16)
A. Adult Education
B. Social Foundations (Staff)

EDUC 899 (499). DISSERTATION RESEARCH. (Doctorate Level) (Staff)

EARLY CHILDHOOD-ELEMENTARY EDUCATION

The Department of Early Childhood-Elementary Education offers two undergraduate curricula leading to the Bachelor of Science degree:

1. Early Childhood Education—for the preparation of teachers in nursery school, kindergarten and primary grades (grades one, two and three).
2. Elementary Education—for the preparation of teachers of grades one through six.

Students who wish to become certificated teachers for nursery school and/or kindergarten must follow the early childhood education curriculum (1. above). Students who seek certification for teaching the intermediate grades must follow the elementary education curriculum (2. above). Students who plan to teach in the primary grades can achieve certification in either 1. or 2.

After June commencement 1972, all students graduating in early childhood education or elementary education will fulfill the requirements of the appropriate present curriculum or its counterpart as of June 1966, depending upon the date of admission to the Department of Early Childhood-Elementary Education.

AREA OF ACADEMIC CONCENTRATION

Students in early childhood-elementary education are required to develop within their degree programs an area of academic concentration consisting of a minimum of 18 semester hours, at least 12 semester hours beyond required work in the area. Approved areas are: anthropology, astronomy, botany, chemistry, economics, English, fine arts (art, dance, drama, and music), foreign language, geography, geology, history, mathematics, natural sciences (astronomy, botany, chemistry, geology, meteorology, physics, zoology), philosophy, physics, psychology, recreation, social science (economics, government and politics, psychology, sociology), sociology, zoology.

GRADUATION REQUIREMENTS

One hundred twenty (120) academic credits *plus* the four semester hours in required health and physical education are necessary for graduation. At least 80 of the academic credits must be in fields other than education.

EARLY CHILDHOOD EDUCATION

(Nursery-Kindergarten-Primary)

The Early Childhood Education curriculum has as its primary goal the preparation of nursery school, kindergarten and primary teachers.

Observation and student teaching are done in the University Nursery-Kindergarten School on the campus and in approved schools in nearby communities.

Graduates receive a Bachelor of Science degree and meet the requirements for certification for teaching kindergarten, nursery school and primary grades in Maryland. Students should have had extensive experience in working with children prior to the junior year.

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition or ENGL 171—Honors Composition or alternate	3	..
English Literature	..	3
SPHR 202—Fundamentals of General American Speech or SPCH 100—Public Speaking or SPCH 110—Voice and Diction	3	..
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
MUSC 155—Fundamentals	3	..
ARTE 100—Fundamentals of Art Education or APDS 101—Fundamentals of Design	..	3
BOTN 100—General Botany or BIOL 101 or ENTM 100—Insects or MICB 200—General Microbiology or ZOOL 101—General Zoology	3 or 4*	..
ASTR 100—Introduction to Astronomy or 103 CHEM—General Chemistry or GEOL 100—Geology or PHYS 111—Elements of Physics, Mechanics, Heat and Sound	..	3 or 4*
HIST 221—History of the U.S. to 1865 or HIST 222—History of the U.S. since 1865 or HIST 223—Social and Cultural History of Early America or HIST 224—Social and Cultural History of Modern America or HIST 225—The U.S. in World Affairs	..	3
Approved elective	..	3
	15 or 16	16 or 17
Sophomore Year		
English Literature	3	..
MATH 210—Elements of Mathematics	4	..
MATH 211—Elements of Geometry	..	4
GEOG 100—Introduction to Geography	..	3
ANTH 101 or ECON 201 or ECON 205 or GNED 260 or GVPT 170 or GVPT 100 or GVPT 300 or PSYC 100 or SOCY 100	3	3
BOTN 100 or ENTM 100 or MICB 200 or ZOOL 101 or ASTR 100 or GEOL 100 or PHYS 111 or BIOL 101	3 or 4*	..
HIST 231—Latin American History or HIST 241—Western Civilization or HIST 242—Western Civilization or HIST 251—The Humanities or HIST 252—The Humanities or HIST 253—History of England and Great Britain or HIST 254—History of England and Great Britain or HIST 261—Far Eastern Civilization or HIST 262—Far Eastern Civilization or HIST 271—Islamic Civilization or HIST 272—Islamic Civilization	..	3
Approved elective	3	3
	16 or 17	16

*Two of the three science requirements must be laboratory courses.

Junior Year			
Fine Arts or Philosophy	3		..
EDUC 300—Human Development and Learning	6	or	6
EDEL 303—Activities and Materials in Early Childhood Education	3		..
MUED 450—Music in Early Childhood Education	3		..
EDEL 301—Science in the Elementary School	..		2
EDEL 306—Social Studies in the Elementary School	..		2
EDEL 310—The Child and the Curriculum	..		2
EDEL 313—Mathematics in the Elementary School.	..		2
EDEL 325—The Teaching of Reading	..		2
Approved electives	6	or	6
	15		16
Senior Year			
EDUC 301—Foundations of Education	3		..
EDEL 330—Student Teaching, Nursery School (4)	4		..
EDEL 331—Student Teaching, Kindergarten (4)	4		..
EDEL 332—Student Teaching, Primary (8)			8
Approved electives	4		7
	15		15

ELEMENTARY EDUCATION

This curriculum is designed for regular undergraduate students who wish to qualify for teaching positions in elementary schools. Students who complete the curriculum will receive the Bachelor of Science degree, and they will meet the Maryland State Department of Education requirements for the Standard Professional Certificate in Elementary Education. The curriculum also meets certification requirements in many other states, Baltimore and the District of Columbia.

	Semester I	Semester II
Freshman Year		
ENGL 101 or ENGL 171—Honors Composition or alternate	3	..
English Literature	..	3
SPHR 202—Fundamentals of General American Speech or SPCH 100—Public Speaking or SPCH 110—Voice and Diction	3	..
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
MUSC 155—Fundamentals	3	..
ARTE 100—Fundamentals of Art Education or APDS 101—Fundamentals of Design	..	3
BOTN 100—General Botany or BIOL 101 or ENTM 100—Insects or MICB 200—General Microbiology or ZOOL 101—General Zoology	3 or 4	..
ASTR 100—Introduction to Astronomy or CHEM 103—General Chemistry or GEOL 100—Geology or PHYS 111—Elements of Physics; Mechanics, Heat and Sound	..	3 or 4*
HIST 221—History of the U.S. to 1865 or HIST 222—History of the U.S. since 1865 or		

HIST 223—Social and Cultural History of Early America or		
HIST 224—Social and Cultural History of Modern America or		
HIST 225—The U.S. In World Affairs ..		3
Approved elective		3
	15 or 16	16 or 17

*Two of the three science requirements must be laboratory courses.

Sophomore Year		
English Literature	3	..
MATH 210—Elements of Mathematics..	4	..
MATH 211—Elements of Geometry	..	4
GEOG 100—Introduction to Geography	..	3
ECON 201 or ECON 205 or ANTH 101 or GNED 260 or GVPT 170 or GVPT 100 or GVPT 300 or PSYC 100 or SOCY 100	3	3
BOTN 100 or ENTM 100 or MICB 200 or ZOOL 101 or ASTR 101 or GEOL 100 or PHYS 111 or BIOL 101	3 or 4*	..
HIST 231—Latin American History or		
HIST 232—Latin American History or		
HIST 241— Western Civilization or		
HIST 242—Western Civilization or		
HIST 251—The Humanities or		
HIST 252—The Humanities or		
HIST 253—History of England and Great Britain or		
HIST 254—History of England and Great Britain or		
HIST 261—Far Eastern Civilization or		
HIST 262—Far Eastern Civilization or		
HIST 271—Islamic Civilization or		
HIST 272—Islamic Civilization	..	3
Approved Electives	3	3
	16 or 17	16

*Two of the three science requirements must be laboratory courses.

Junior Year			
Fine Arts or Philosophy	3		
EDUC 300—Human Development and Learning	6	or	6
EDEL 302—Science in the Elementary School	2		..
EDEL 305—Language Arts in the Elementary School	..		2
EDEL 307—Social Studies in the Elementary School	2		..
EDEL 314—Mathematics in the Elementary School	..		2
EDEL 326—The Teaching of Reading..	..		2
Approved electives	2 or 8		3 or 9
	15		15
Senior Year			
EDEL 333—Student Teaching in the Elementary School	16		..
EDUC 301—Foundations of Education	..		3
EDEL 312—Art in the Elementary School or			
MUED 352—Music for the Elementary Classroom Teacher or			
PHED 420—Physical Education for Elementary School	..		2 or 3
Approved electives	0		9
	16		14 or 15

PHYSICAL EDUCATION AND HEALTH EDUCATION CURRICULUM—ELEMENTARY SCHOOL

Students enrolled in the College of Education and majoring in elementary education may pursue an area of specialization in elementary school physical education and health education. Students interested in this area should consult the Dean of the College of Physical Education, Recreation and Health.

MUSIC EDUCATION CURRICULUM—ELEMENTARY SCHOOL

Students enrolled in the College of Education and majoring in elementary education may pursue an area of specialization in elementary school music education with vocal or instrumental emphasis, and thereby qualify for the Bachelor of Science certificate in special subjects.

In order to fulfill requirements in this area, the following courses should be taken in addition to those required in the elementary education curriculum. Students are also required to pass the Musicianship Examination given by the Music Education Division before the students enroll for student teaching. (Students should consult their advisor in music education for details.)

A. *General Music,* 18 semester hours. Music theory, MUSC 150, 151, 250 (3,3,4); music literature and history, MUSC 131, 331 (3,3); conducting, MUSC 490 (2).

B. *Applied Music,* 14 semester hours divided between private and class instruction. Students must complete MUSC 209 on their major instrument. Students in the instrumental option elect six semester hours of class instruction from MUSC 113-122; 213.

C. *Professional Courses,* eight semester hours. Methods, MUED 462 for vocal emphasis, or MUED 410 (2) for instrumental emphasis; six semester hours of student teaching, (included in the 16 hours of student teaching required of Early Childhood-Elementary Education majors.)

FOREIGN LANGUAGE CURRICULUM—EARLY CHILDHOOD-ELEMENTARY SCHOOL (FLES)

Foreign Language Curriculum—Early Childhood-Elementary majors, Arts and Science foreign language majors, and secondary education foreign language majors are eligible for admission. Students interested in FLES should contact the Foreign Language Education advisor in the Department of Secondary Education for further information concerning the requirements for certification in FLES.

FACULTY

Early Childhood Education: Kathleen G. Amershek, Marilyn Church, Sarah Lou Leeper, Carol Seefeldt, Thomas D. Yawkey.

Elementary Education: Evelyn Anderson, Robert B. Ashlock, Thomas A. Butler, Bruce W. Brigham, Maureen Dietz, Robert V. Duffey, George Eley, Walter N. Gantt, Maryanne Hall, Wayne L. Herman, Lloyd B. Hutchings, Susannah M.

McCuaig, Richard W. O'Donnell, Leo W. O'Neill, Jesse A. Roderick, Elisabeth Schumacher, Dorothy D. Sullivan, V. Phillips Weaver, Tommie West, David L. Williams, Robert M. Wilson, James H. Wirth, Lillian B. Zachary.

PRIMARILY FOR FRESHMEN AND SOPHOMORES

EDEL 288 (088). SPECIAL PROBLEMS IN EDUCATION. (1-6)
See EDUC 288 for description. (Staff)

FOR ADVANCED UNDERGRADUATES

EDEL 301 (105A). SCIENCE IN EARLY CHILHOOD EDUCATION. (2)

EDEL 302 (105B). SCIENCE IN THE ELEMENTARY SCHOOL. (2)
Designed to help teachers acquire general science understandings and to develop teaching materials for practical use in classrooms. Includes experiments, demonstrations, constructions, observations, field trips and use of audio-visual materials. The emphasis is on content and method related to science units in common use in elementary schools. Formerly Sci. Ed. 105.
(Dietz, Eley, Williams)

EDEL 303 (115). ACTIVITIES AND MATERIALS IN EARLY CHILDHOOD EDUCATION. (3)
First and second semesters. Prerequisite, EDUC 300 (or concurrent enrollment). Storytelling, selection of books, the use, preparation and presentation of such raw materials as clay, paints (easel and finger), blocks, wood, and scrap materials.

EDEL 304 (121A). LANGUAGE ARTS IN EARLY CHILDHOOD EDUCATION. (2)
Teaching of spelling, handwriting, oral and written expression, and creative expression.

EDEL 305 (121B). LANGUAGE ARTS IN THE ELEMENTARY SCHOOL. (2)

EDEL 306 (122A). SOCIAL STUDIES IN EARLY CHILDHOOD EDUCATION. (2)

EDEL 307 (122B). SOCIAL STUDIES IN THE ELEMENTARY SCHOOL. (2)
Consideration given to curriculum, organization and methods of teaching, evaluation of newer materials, and utilization of environmental resources.
(Duffey, Herman, O'Donnell, O'Neill, Weaver)

EDEL 310 (123A). THE CHILD AND THE CURRICULUM—EARLY CHILDHOOD. (2)

EDEL 311 (123B). THE CHILD AND THE CURRICULUM—ELEMENTARY. (2)
Relationship of the elementary school curriculum to child growth and development. Recent trends in curriculum organization; the effect of environment on learning; readiness to learn; and adapting curriculum content and methods to maturity levels of children.
(Amershek, Schumacher)

EDEL 312 (125). ART IN THE ELEMENTARY SCHOOL. (2)
Concerned with art methods and materials for elementary schools. Includes laboratory experiences with materials appropriate for elementary schools.
(Lembach, Longley)

EDEL 313 (126A). MATHEMATICS IN EARLY CHILDHOOD EDUCATION. (2)

EDEL 314 (126B). MATHEMATICS IN THE ELEMENTARY SCHOOL. (2)
Emphasis on materials and procedures which help pupils sense arithmetical meanings and relationships. Helps teachers gain a better understanding of the number system and arithmetical processes.
(Ashlock, Martin, Schindler)

EDEL 315 (127A). TEACHING IN NURSERY SCHOOL AND KINDERGARTEN. (3)
An overview of nursery school and kindergarten teaching designed for individuals without specific preparation for elementary school teaching or for individuals without recent teaching experience. (Staff)

EDEL 316 (127B). TEACHING IN THE ELEMENTARY SCHOOL. (3)
An overview of elementary school teaching for individuals without recent teaching experience.

EDEL 320 (140A). CURRICULUM AND INSTRUCTION NURSERY SCHOOL. (3)
Philosophy of early childhood education, observation of the development needs at various age levels, with emphasis upon the activities, materials and methods by which educational objectives are attained. (Staff)

EDEL 321 (140B). CURRICULUM AND INSTRUCTION—CHILDHOOD. (3) (Staff)

EDEL 322 (140C). CURRICULUM AND INSTRUCTION—ELEMENTARY. (3) (Staff)
See EDEL 320 above.

EDEL 323 (143). FOREIGN LANGUAGE METHODS IN THE ELEMENTARY SCHOOL. (3)
Registration limited and based upon approval of advisor. Methods and techniques for developmental approach to the teaching of modern foreign languages in elementary schools. Use of real development of oral-aural skills and understanding of young children in language development are stressed. (Staff)

EDEL 324 (152). LITERATURE FOR CHILDREN AND YOUNG PEOPLE. (3)
Development of literary materials for children and young people. Timeless and ageless books, and outstanding examples of contemporary publishing. Evaluation of the contributions of individual authors and illustrators and children's book awards.
(Amershek, E. Anderson, Hall, Roderick, Zachary)

EDEL 325 (153A). THE TEACHING OF READING—EARLY CHILDHOOD. (2)
Concerned with the fundamentals of development reading instruction, including reading readiness, use of experience records, procedures in using basal readers, the improvement of comprehension, teaching reading in all areas of the curriculum, uses of children's literature, the program in word analysis, and procedures for determining individual needs.
(Duffey, Hall, McCuaig, Sullivan, Zachary)

EDEL 326 (153B). THE TEACHING OF READING—ELEMENTARY. (2)
See EDEL 325 above.

EDEL 330 (149A). STUDENT TEACHING—NURSERY. (4)

EDEL 331 (149B). STUDENT TEACHING—KINDERGARTEN. (4)

EDEL 332 (149C). STUDENT TEACHING—PRIMARY. (8)

EDEL 333 ((149D). STUDENT TEACHING—ELEMENTARY. (8-16)

EDEL 334 (149E). STUDENT TEACHING—LIBRARY. (4)

EDEL 335 (149F). STUDENT TEACHING—MUSIC. (4-6)

EDEL 336 (149G). STUDENT TEACHING—PHYSICAL EDUCATION. (4-8)
Student teaching is a full time commitment. Consequently, interference with this commitment due to employment is not permitted.
Transportation to the school(s) assigned for student teaching is the responsibility of each student.
Student teachers in elementary, early childhood, special education and library science should reserve the week of registration for orientation in public schools. A doctor's certificate indicating freedom from communicable diseases and approval of the instructor required. Undergraduate credit only. No other courses may be taken during a full semester of student teaching. For 16 credits, full time for one semester is devoted to this work. For experienced teachers the time and credit may be reduced to not less than 8 credits. (Staff)

EDEL 401. (105A). SCIENCE IN EARLY CHILDHOOD EDUCATION. (3)
See EDEL 301 above. (Staff)

EDEL 402 (105B). SCIENCE IN THE ELEMENTARY SCHOOL. (3)
See EDEL 302 above. (Staff)

EDEL 404 (121A). LANGUAGE ARTS IN EARLY CHILDHOOD EDUCATION. (3)
See EDEL 304 above. (Staff)

EDEL 405 (121B). LANGUAGE ARTS IN THE ELEMENTARY SCHOOL. (3)
See EDEL 305 above. (Staff)

EDEL 406 (122A). SOCIAL STUDIES IN EARLY CHILDHOOD EDUCATION. (3)
See EDEL 306 above. (Staff)

EDEL 407 (122B). SOCIAL STUDIES IN THE ELEMENTARY SCHOOL. (3)
See EDEL 307 above. (Staff)

EDEL 410 (123A). THE CHILD AND THE CURRICULUM—EARLY CHILDHOOD.(3)
See EDEL 310 above (Staff)

EDEL 411 (123B). THE CHILD AND THE CURRICULUM—ELEMENTARY. (3)
See EDEL 311 above. (Staff)

EDEL 412 (125). ART IN THE ELEMENTARY SCHOOL. (3)
See EDEL 312 above. (Staff)

EDEL 413. (126A). MATHEMATICS IN EARLY CHILDHOOD EDUCATION. (3)
See EDEL 313 above. (Staff)

EDEL 414 (126B). MATHEMATICS IN THE ELEMENTARY SCHOOL. (3)
See EDEL 314 above. (Staff)

EDEL 424 (152). LITERATURE FOR CHILDREN AND YOUNG PEOPLE—ADVANCED. (3)
See EDEL 324 above.

EDEL 425 (153A). THE TEACHING OF READING—EARLY CHILDHOOD. (3)
See EDEL 325 above. (Staff)

EDEL 426. (153B). THE TEACHING OF READING—ELEMENTARY. (3)
See EDEL 325 above. (Staff)

EDEL 430 (157). CORRECTIVE—REMEDIAL READING INSTRUCTIONS. (3) (Staff)

EDEL 431 (155). LABORATORY PRACTICES IN READING. (3) (Staff)

EDEL 489 (187). FIELD EXPERIENCE IN EDUCATION. (1-4)
See EDUC 489 for description. (Staff)

EDEL 498 ((188). SPECIAL PROBLEMS IN EDUCATION. (1-3)
See EDUC 498 for description. (Staff)

EDEL 499 (189). WORKSHOPS, CLINICS AND INSTITUTES. (1-6)
See EDUC 499 for description. (Staff)

FOR GRADUATES

See Graduate catalog for descriptions.

EDEL 600 (200). SEMINAR IN ELEMENTARY EDUCATION. (3) (O'Neill)

EDEL 601 (205). PROBLEMS IN TEACHING SCIENCE IN ELEMENTARY SCHOOLS. (3) (Dietz, Eley, Williams)

EDEL 605 (221). PROBLEMS OF TEACHING LANGUAGE ARTS IN ELEMENTARY SCHOOLS. (3)
(Schumacher, Roderick, Gannt, O'Donnell, Zachary)

EDEL 607 (222). PROBLEMS OF TEACHING SOCIAL STUDIES IN ELEMENTARY SCHOOLS. (3)
(Duffey, Herman, O'Donnell, O'Neill, Potterfield, Weaver)

EDEL 614 (226). PROBLEMS OF TEACHING MATHEMATICS IN ELEMENTARY SCHOOLS. (3)
(Ashlock, Martin, Schindler)

EDEL 615 (227). DIAGNOSIS AND REMEDIATION OF ARITHMETIC DISABILITIES. (3) (Hutchings)

EDEL 626 (253). PROBLEMS OF TEACHING READING IN ELEMETIC DISABILITIES. (3) (Staff)

EDEL 630 (257). DIAGNOSIS AND REMEDIATION OF READING DISABILITIES. (3) Staff)

EDEL 631, 632 (255, 256). ADVANCED LABORATORY EXPERIENCES IN READING INSTRUCTION. (3, 3) (Staff)

EDEL 640 (210). CURRICULUM PLANNING IN NURSERY-KINDERGARTEN EDUCATION. (3) (Leeper)

EDEL 641 (211). THE YOUNG CHILD IN THE COMMUNITY. (3) (Amershek)

EDEL 642 (212). THE YOUNG CHILD IN SCHOOL. (3) (Leeper)

EDEL 643 (213). TEACHER-PARENT RELATIONSHIPS. (3) (Amershek)

EDEL 644 (214). INTELLECTUAL AND CREATIVE EXPERIENCES OF THE NURSERY-KINDERGARTEN CHILD. (3) (Moyer)

EDEL 798 (288). SPECIAL PROBLEMS IN EDUCATION. (1-6) (Staff)

EDEL 799 (399). THESIS RESEARCH. (Master's Level) (Staff)

EDEL 888 (224). APPRENTICESHIP IN EDUCATION. (1-9) (Staff)

EDEL 889 (287). INTERNSHIP IN EDUCATION. (3-16) (Staff)

EDEL 899 (499). DISSERTATION RESEARCH. (Doctorate Level) (Staff)

INDUSTRIAL EDUCATION

The Department of Industrial Education offers programs leading to teacher certification in industrial arts and vocational-industrial education. It also offers a program in education for industry which prepares individuals for supervisory and industrial management positions, and an industrial technology program for persons with advanced technical preparation who wish to teach in technical institutes or junior colleges.

Three curricula are administered by the Industrial Education Department: (1) Industrial Arts Education, (2) Vocational-Industrial Education and (3) Education for Industry. The overall offering includes both undergraduate and graduate programs leading to the degrees of: Bachelor of Science, Master of Education, Master of Arts, Doctor of Education, and Doctor of Philosophy.

The Industrial Arts Education curriculum prepares persons to teach industrial arts at the secondary school level. It is a four-year program leading to a Bachelor of Science degree. While trade or industrial experience contributes significantly to the background of the industrial arts teacher, previous work experience is not a condition of entrance into this curriculum. Students who are enrolled in the curriculum are encouraged to obtain work in industry during the summer months. Industrial arts as a secondary school subject area is a part of the general education program characterized by extensive laboratory experiences.

The vocational-industrial curriculum may lead either to certification as a vocational-industrial teacher with no degree involved or to a Bachelor of Science degree, including certification. The University of Maryland is designated as the institution which shall offer the "Trade and Industrial" certification courses and hence the courses which are offered are those required for certification in Maryland. The vocational-industrial curriculum requires trade competence as specified by the *Maryland State Plan for Vocational Education.* A person who aspires to take the certification courses

should review the State plan and may well contact Maryland State Department of Education officials. If the person has in mind teaching in a designated city or county, he may discuss his plans with the vocational-industrial official of that city or county inasmuch as there are variations in employment and training procedures.

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition or alternate	3	..
English Literature or World Literature	..	3
SOCY 100—Introduction to Sociology or PSYC 100—Introduction to Psychology	3	..
Physical Education	1	1
SPCH 100—Public Speaking	3	..
EDIN 101—Mechanical Drawing I	2	..
EDIN 102—Woodworking I	3	..
EDIN 112—Shop Calculation	..	3
ART—Art elective or	..	..
PHIL—Philosophy elective	..	3
HLTH 105—Science and Theory of Health	..	2
EDIN 121—Mechnical Drawing II	..	2
EDIN 122—Woodworking II	..	3
Total	15	17
Sophomore Year		
English Literature or World Literature	3	..
HIST 221—History of U.S. to 1865, or	..	..
HIST 222—History of U.S. since 1865	3	..
HIST—History elective	..	3
PHYS 111 and PHYS 112—Elements of Physics: Mechanics, Heat and Sound	3	3
EDIN 127—Electricity—Electronics I	3	..
EDIN 133—Automotives I	3	..
EDIN 241—Architectural Drawing	2	..
MATH 110—Introduction to Mathematics	..	3
EDIN 247—Electricity—Electronics II	..	3
EDIN 223—Arc and Gas Welding	..	1
EDIN 210—Foundry	..	1
Total	17	14
Junior Year		
CHEM 103, 104—General Chemistry	4	4
EDUC 300—Human Development and Learning	6	..
ECON 205—Fundamentals of Economics	..	3
EDIN 262—Machine Shop Practice I	3	..
EDIN 226—General Metal Work	..	3
EDIN 311—Laboratory Practicum in Industrial Arts	..	3
EDIN 134—Graphic Arts I	..	3
Elective (Laboratory)	4	..
Elective (Unspecified)	..	3
Total	17	19
Senior Year		
EDIN 340—Curriculum, Instruction and Observation	3	..
EDIN 347—Student Teaching in Secondary Schools	8	..
EDSE 330—Principles and Methods of Secondary Education	3	..
EDIN 464—Laboratory Organization and Management	..	3
EDIN 466—Educational Foundation of Industrial Arts	..	3
EDUC 301—Foundations of Education	..	3
EDUC—Electives	..	6
Electives (Unspecified)	..	2
Total	14	17

VOCATIONAL-INDUSTRIAL EDUCATION

The vocational-industrial curriculum is a four-year program of studies leading to a Bachelor of Science degree in education. It is intended to develop the necessary competencies for the effective performance of the tasks of a vocational teacher. In addition to establishing the adequacy of the student's skills in a particular trade and the development of instructional efficiency, the curriculum aims at the professional and cultural development of the individual. Courses are included which would enrich the person's scientific, economic, psychological and sociological understandings. The vocational-certification courses for the State of Maryland are a part of the curriculum requirements.

Persons pursuing this curriculum must present documentary evidence of having an apprenticeship or comparable learning period and journeyman experience. This evidence of background and training is necessary in order that the trade examination phase of the curriculum may be accomplished.

Persons having completed the necessary certification courses prior to working on the degree program may use such courses toward meeting graduation requirements. However, after certification course requirements have been met, persons continuing studies toward a degree must take courses in line with the curriculum plan and University regulations. For example, junior level courses cannot be taken until the student has reached full junior standing.

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition or alternate	3	..
English Literature	..	3
SOCY 100—Introduction to Sociology	3	..
SPCH 100—Public Speaking	3	..
ECON 205—Fundamentals of Economics	..	3
EDIN 112—Shop Calculation	3	..
MATH 110—Introduction to Mathematics or MATH 105—Fundamentals of Mathematics	..	3
Physical Education	1	1
HLTH 105—Science and Theory of Health	..	2
Total	13	12
Sophomore Year		
ENGL 201—World Literature or English Literature	3	..
ART—Art elective or PHIL—Philosophy elective	..	3
HIST 221—History of the U.S. to 1865, or HIST 222—History of the U.S. since 1865	3	..
HIST—History elective	..	3
Physical Sciences	3	3
PSYC 100—Introduction to Psychology	3	..
CHEM 103—General Chemistry or ZOOL 101—General Zoology	..	4
Total	12	13
Trade Examination		20
Junior Year		
EDIN 450—Training Aids Development	..	3
EDIN 465—Modern Industry	3	..
EDUC 300—Human Development and Learning	6	..

EDIN 462—Occupational Analysis and Course Construction	3	..
CHEM 104 or BOTN 101	4	..
EDIN 471—History and Principles of Vocational Education	..	3
EDIN 457—Tests and Measurements	..	3
Approved electives	..	3
Total	16	12
Senior Year		
EDIN 340—Curriculum, Instruction and Observation	3	..
EDSE 330—Principles and Methods of Sec. Ed.	3	..
EDIN 347—Student Teaching in Secondary Schools	8	..
EDCP 410—Introduction to Counseling and Personnel Services	3	..
Electives	..	6
EDUC 301—Social Foundations of Education	..	3
EDIN 464—Laboratory Organization and Management	..	3
Ed. electives	..	3
Total	17	15

STUDENT TEACHING REQUIREMENT

Persons currently teaching in the secondary schools with three or more years of satisfactory experience at that level are not required to take EDIN 347—Student Teaching in Secondary Schools. Evidence of satisfactory teaching experience shall be presented in the form of written statements from the principal area supervisor and department head in the school where such teaching is done. Instead of the eight credits required for student teaching, the individual meeting the above qualifications will have eight additional semester hours of elective credits.

ELECTIVE CREDITS

Courses in history and philosophy of education, sociology, speech, psychology, economics, business administration and other areas may be taken with the permission of the student's advisor.

Elective courses in the technical area (shop and drawing) will be limited to courses and subjects not covered in the trade training experience. Courses dealing with advanced technology and recent improvements in field practices will be acceptable.

VOCATIONAL-INDUSTRIAL CERTIFICATION

A person to become certified as a trade industrial and service occupations teacher in the State of Maryland must successfully complete 18 credit hours of instruction.

The following courses must be included in the 18 credit hours of instruction:

EDIN 350—Methods of Teaching
EDIN 464—Laboratory Organization and Management
EDIN 457—Tests and Measurements
EDIN 462—Occupational Analysis and Course Construction

The remainder of the credit hours shall be met through the election of the following courses:

EDIN 450—Training Aids Development
EDIN 461—Principles of Vocational Guidance
EDIN 465—Modern Industry
EDIN 467—Problems in Occupational Education
EDIN 471—History and Principles of Vocational Education
EDCP 410—Introduction to Counseling and Personnel Services
EDCP 411—Mental Hygiene in the Classroom
Educational Psychology or its equivalent

A person in Vocational-Industrial Education may use his certification courses toward a Bachelor of Science degree. In doing so the general requirements of the University and College of Education must be met. A maximum of 20 semester hours of credit may be earned through examination in the trade in which the student has competence. Prior to taking the examination, the student shall provide documentary evidence of his apprenticeship or learning period and journeyman experience. For further information about credit by examination refer to the *academic regulations*.

EDUCATION FOR INDUSTRY

The Education for Industry curriculum is a four-year program leading to a Bachelor of Science degree. The purpose of the program is to prepare persons for jobs within industry and, as such, it embraces four major areas of competence: (a) technical competence, (b) human relations and leadership competence, (c) communications competence, and (d) social and civic competence.

	Semester I	Semester II
Freshmen Year		
ENGL 101—Composition or alternate	3	..
English Literature	..	3
SOCY 100 or ANTH 100—Introduction to Sociology or Introduction to Anthropology	3	..
EDIN 101—Mechanical Drawing I	2	..
EDIN 112—Shop Calculation	3	..
EDIN 121—Mechanical Drawing II	..	2
EDIN 122—Woodworking II	3	..
EDIN 223—Arc and Gas Welding	..	1
EDIN 262—Machine Shop Practice I	..	3
EDIN 210—Foundry	..	1
Physical Education	1	1
MATH 110—Introduction to Mathematics	..	3
Total	15	14
Sophomore Year		
ART—Art Elective	..	3
English Literature	3	..
EDIN 124—Sheet Metal Work	2	..
BSAD 110—Elements of Business Enterprise	3	..
SPCH 107—Public Speaking	..	2
PHYS 111, 112—Elements of Physics: Mechanics, Heat and Sound or Elements of Physics: Magnetism, Electricity, and Optics or PHYS 121, 122—Fundamentals of Physics	3 or 4	3 or 4
MATH 111—Introduction to Mathematics	3	..
HLTH 105—Science and Theory of Health	..	2
HIST 242—Western Civilization	..	3
ECON 205—Fundamentals of Economics	..	3
EDIN 184—Organized and Supervised Work Experience	3	..
Total	17 or 18	16 or 17

Junior Year		
History Elective	3	..
PSYC 100—Introductcion to Psychology	3	..
PSYC 235—Personality and Adjustment	..	3
CHEM 103, 104—General Chemistry	4	4
ECON 470—Labor Economics	3	..
EDIN 324—Organized and Supervised Work Experience	3	..
EDIN 443-444—Industrial Safety Education I and II	2	2
BSAD 360—Personnel Management I	..	3
SOCY 462—Industrial Sociology	..	3
Electives	3	3
Total	21	18
Senior Year		
BSAD 460—Personnel Management II or BSAD 230—Business I	3	..
BSAD 362—Labor Relations	3	..
BSAD 385—Production Management	..	3
EDIN 465—Modern Industry	3	..
EDIN 425—Industrial Training in Industry I or EDIN 475—Recent Technological Developments in Products and Processes	..	3
PSYC 365—Industrial Psychology	..	3
Electives	5	7
Total	14	16

FACULTY:

Lowell D. Anderson, Charles Beatty, Clifton Campbell, Kinneth Chambliss, Robert C. Cooksey, Edmund D. Crosby, John Barry DuVall, Robbert J. Gelina, Karl E. Gettle, Paul E. Harrison, Joseph F. Luetkemeyer, Donald Maley, Walter Mietus, Marvin M. Schlesinger, Kenneth F. Stough, William F. Tierney, Edward H. White.

EDIN 101 (001). MECHANICAL DRAWING. (2)
Four hours of laboratory per week. This course constitutes an introduction to orthographic multi-view and isometric projection. Emphasis is placed upon the visualization of an object when it is represented by a multi-view drawing and upon the making of multi-view drawings. The course carries through auxiliary views, sectional views, dimensioning, conventional representation and single stroke letters. (Campbell)

EDIN 102 (002). WOODWORKING I. (3)
Six hours of laboratory per week. The course is designed to give the student an orientation into the woodworking industry with regard to materials, products and processes while providing for skill development in the care and use of hand and power tools. (White)

EDIN 106 (009). INDUSTRIAL ARTS IN THE ELEMENTARY SCHOOL I. (2)
Four hours of laboratory per week. A course for preservice and in-service elementary school teachers covering construction activities in a variety of media suitable for classroom use. The work is organized on the unit basis so that the construction aspect is supplemented by reading and other investigative procedures. (Gettle)

EDIN 110 (010). INDUSTRIAL ARTS IN THE ELEMENTARY SCHOOL II. (2)
Prerequisite, EDIN 106. This is a continuation of EDIN 106. Four hours of laboratory per week. It provides the teacher with opportunities to develop further competence in construction activities. Some of the basic phenomena of industry are studied, particularly those which apply to the manufacture of common products, housing, transportation and communication. (Gettle)

EDIN 112 (012). SHOP CALCULATIONS. (3)
Shop Calculations is designed to develop an understanding and working knowledge of the mathematical concepts related to the various aspects of industrial education. The course includes phases of algebra, geometry, trigonometry, and general mathematics as applied to shop and drawing activities. (Gelina, Stough)

EDIN 121 (021). MECHANICAL DRAWING. (2)
Four hours of laboratory per week. Prerequisite, EDIN 101. A course dealing with working drawings, machine design, pattern layouts, tracing and reproduction. Detail drawings followed by assemblies are presented. (Campbell)

EDIN 122 (022). WOODWORKING II. (3)
Six hours of laboratory per week. Prerequisite, EDIN 102, for industrial arts teacher education majors. The course is designed to give the student a comprehensive knowledge of machine production with emphasis on safety, industrial processes and maintenance. (White)

EDIN 124 (024). SHEET METAL WORK. (2)
Four hours of laboratory per week. Articles are made from metal in its sheet form and involve the operations of cutting, shaping, soldering, riveting, wiring, folding, seaming, beading, burning, etc. The student is required to develop his own patterns inclusive of parallel line development radial line development, and triangulation. (Crosby)

EDIN 127 (028). ELECTRICITY-ELECTRONICS I. (3)
Six hours of laboratory per week. An introductory course to electricity-electronics in general, dealing with electrical circuits and wiring, the measurement of electrical energy, the theory of motors and generators and an introduction to vacuum tubes, transistors and power supplies. (Schlesinger)

EDIN 133 (033). AUTOMOTIVES I. (3)
Six hours of laboratory per week. Automotives I is a study of the fundamentals of internal combustion engines as applied to transportation. A study of basic materials and methods used in the transportation industry is included. (Cooksey)

EDIN 134 (034). GRAPHIC ARTS I. (3)
Six hours of laboratory per week. An introductory course involving experiences in letterpress and offset printing practices. This course includes typographical design, hand composition, proof reading, stock preparation, offset plate making, imposition, lock-up, stock preparation, presswork, linoleum block cutting, paper marbelizing, and bookbinding. (DuVall)

EDIN 184 (084). ORGANIZED AND SUPERVISED WORK EXPERIENCES. (3)
See description under EDIN 324. (Crosby)

EDIN 201 (101). OPERATIONAL DRAWING. (2)
Four hours of laboratory per week. Prerequisite, EDIN 101, or equivalent. A comprehensive course designed to give students practice in the modern drafting methods of industry. (Campbell)

EDIN 210 (110). FOUNDRY. (1)
Two hours of laboratory per week. Bench and floor molding and elementary core making. Theory and principles covering foundry materials, tools and appliances. (Staff)

EDIN 223 (023). ARC AND GAS WELDING. (1)
Two hours of laboratory per week. A course designed to develop a functional knowledge of the principles and use of electric and acetylene welding. Practical work is carried on in the construction of various projects using welded joints. Instruction is given in the use and care of equipment, types of welded joints, methods of welding, importance of welding processes in industry, safety consideration, etc. (Staff)

EDIN 226 (026). GENERAL METAL WORK. (3)
Six hours of laboratory per week. This course provides experiences in constructing items from aluminum, brass, copper, pewter, and steel. The processes included are designing, layout, heat treating, forming, surface decorating, fastening, and assembling. The course also includes a study of the aluminum, copper, and steel industries in terms of their basic manufacturing processes. (Staff)

EDIN 231 (031). MECHANICAL DRAWING. (2)
Four hours of laboratory per week. Prerequisites, EDIN 101 and 121. A course dealing with the topics enumerated in EDIN 121 but on a more advanced basis. The reading of prints representative of a variety of industries is a part of this course. (Campbell)

EDIN 241 (041). ARCHITECTURAL DRAWING. (2)
Four hours of laboratory per week. Prerequisite, EDIN 101 or equivalent. Practical experience is provided in the design and planning of houses and other buildings. Working drawings, specifications, and blue-prints are featured. (Campbell)

EDIN 242 (042). WOODWORKING III. (3)
Six hours of laboratory per week. Prerequisite, EDIN 122. The course is designed to give the student a comprehensive knowledge of contemporary woodworking technology with emphasis on mass production techniques, industrial research, and materials tests. (White)

EDIN 243 (043). AUTOMOTIVES II. (3)
Six hours of laboratory per week. Prerequisite, EDIN 133. This is an advanced course in transportation and power generation covering engines, fuel systems, ignition systems, and power trains. (Cooksey)

EDIN 244 (044). GRAPHIC ARTS II. (3)
Six hours of laboratory per week. Prerequisite, EDIN 134. An advanced course designed to provide further experiences to letterpress and offset printing and to introduce other reproduction processes. Silk screen printing, dry print etching, mimeograph reproduction, and rubber stamp making are the new processes introduced in this course. (DuVall)

EDIN 247 (048). ELECTRICITY-ELECTRONICS II. (3)
Six hours of laboratory per week. Prerequisite, EDIN 127 or equivalent. An intermediate course designed to provide more extensive knowledge in electricity-electronics including the principles of the transmission and reception of radio waves, the applications of transistors and other semiconductors and an introduction to industrial electronics. (Schlesinger)

EDIN 262 (069). MACHINE SHOP PRACTICE I. (3)
Six hours of laboratory per week. Prerequisite, EDIN 101, or equivalent. Bench work, turning, planing, milling, and drilling. Related technical information. (Staff)

EDIN 266 (066). ART METAL WORK. (2)
Four hours of laboratory per week. Prerequisite, EDIN 226, or equivalent. Advanced practicum. It includes methods of bowl raising and bowl ornamenting. (Crosby)

EDIN 282 (089). MACHINE SHOP PRACTICE II. (3)
Four hours of laboratory per week. Prerequisite, EDIN 262, or equivalent. Advanced shop practicum in thread cutting, grinding, boring, reaming and gear cutting. Work-production methods are employed. (Staff)

EDIN 288 (088). SPECIAL PROBLEMS IN EDUCATION. (1-6)
See EDUC 288 for description. (Staff)

EDIN 305 (105). GENERAL SHOP. (3)
Designed to meet needs in organizing and administering a secondary school shop. Students are rotated through skill and knowledge developing activities in a variety of shop areas. (Gettle)

EDIN 307 (108). ELECTRICITY-ELECTRONICS III. (3)
Six hours of laboratory per week. Prerequisite, EDIN 127, or equivalent. An advanced course designed to provide more extensive knowledge in electricity or electronics including the advanced theory and applications of semiconductors and the principles of the storage and transmission of electronically coded information. (Schlesinger)

EDIN 311 (111). LABORATORY PRACTICUM IN INDUSTRIAL ARTS EDUCATION. (3)
Six hours of laboratory per week. Prerequisite, 18 semester hours of shopwork and drawing. A course devoted to the development of instructional materials and the refinement of instructional methods pertinent to the teaching of industrial arts at the secondary school level. (Maley, Gettle)

EDIN 324 (124). ORGANIZED AND SUPERVISED WORK EXPERIENCES.
(3 credits for each internship period, total: 6 credits.) This is a work experience sequence planned for students enrolled in the curriculum, "Education for Industry." The purpose is to provide the students with opportunities for first-hand experiences with business and industry. The student is responsible for obtaining his own employment with the coordinator advising him in regard to the job opportunities which have optimum learning value. The nature of the work experience desired is outlined at the outset of employment and then evaluations made by the student and the coordinator are based upon the planned experiences. The minimum time basis for each internship is 6 forty-hour weeks or 240 work hours. Any one period of internship must be served through continuous employment in a single establishment. Two internships are required. The two internships may be served with the same business or industry. The completion for credit of any period of internship requires the employer's recommendation in terms of satisfactory work and work attitudes. More complete details are found in the handbook prepared for the student of this curriculum. (Staff)

EDIN 340 (140). (EDUC 140). CURRICULUM, INSTRUCTION, AND OBSERVATION. (3)
Major functions and specific contributions of industrial art education; its relation to the general objectives of the junior and senior high schools, selection and organization of subject matter in terms of modern practices and needs; methods of instruction; expected outcomes; measuring results; professional standards. Twenty periods of observation. (Beatty, Anderson, Tierney)

EDIN 347 (148). STUDENT TEACHING IN THE SECONDARY SCHOOLS. (2-8)
First and second semesters. EDSE 367 for additional requirements. (Tierney, Beatty, Anderson)

EDIN 350 (050). METHODS OF TEACHING. (3)
(Offered at University College centers.) For vocational and occupational teachers of shop work and related subjects. The identification and analysis of factors essential to helping others learn; types of teaching situations and techniques; measuring results and grading student progress in shop and related technical subjects.
(Maley, Chambliss)

EDIN 357 (157). TESTS AND MEASUREMENTS. (3)
The construction of objective tests for occupational and vocational subjects. (Luetkemeyer, Stough)

EDIN 407A, B, C, D (109). EXPERIMENTAL ELECTRICITY AND ELECTRONICS. (2, 2, 2, 2)

EDIN 415 (115). RESEARCH AND EXPERIMENTATION IN INDUSTRIAL ARTS. (3)
This is a laboratory-seminar course designed to develop persons capable of planning, directing and evaluating effective research and experimentation procedures with the materials, products and processes of industry.
(Maley)

EDIN 421 (121). INDUSTRIAL ARTS IN SPECIAL EDUCATION. (3)
Four hours laboratory per week, one hour lecture. Prerequisite, EDSP 470 and 471 or consent of instructor. This course provides experiences of a technical and theoretical nature in industrial processes applicable for classroom use. Emphasis is placed on individual research in the specific area of one major interest in special education. (Staff)

EDIN 425, 426 (125, 126). INDUSTRIAL TRAINING IN INDUSTRY I, II. (3,3)
The first course is designed to provide an overview of the function of industrial training, type of programs, organization, development and evaluation. The second course (prerequisite the first course) is designed to study specific training programs in a variety of industries, plant program visitation, training, program development, and analyses of industrial training research. (Willard)

EDIN 443 (143). INDUSTRIAL SAFETY EDUCATION I. (2)
This course deals briefly with the history and development of effective safety programs in modern industry and treats causes, effects and values of industrial safety education inclusive of fire prevention and hazard controls. (Crosby, Smith, White)

EDIN 444 (144). INDUSTRIAL SAFETY EDUCATION II. (2)
In this course exemplary safety practices are studied through conference discussions, group demonstration, and organized plant visits to selected industrial situations. Methods of fire precautions and safety practices are emphasized. Evaluative criteria in safety programs are formulated. (Crosby, Smith, White)

EDIN 450 (150). TRAINING AIDS DEVELOPMENT. (3)
Study of the aids in common use as to their source and application. Special emphasis is placed on principles to be observed in making aids useful to shop teachers. Actual construction and application of such devices will be required. (Maley, Beatty, Gettle)

EDIN 457 (157). TESTS AND MEASUREMENTS. (3)
The construction of objective tests for occupational and vocational subjects. (Gelina, Luetkemeyer, Stough)

EDIN 460 (160). ESSENTIALS OF DESIGN. (2)
Two laboratory periods a week. Prerequisite, EDIN 101 and basic shop work. A study of the basic principles of design and practice in their application to the construction of shop projects. (Anderson)

EDIN 461 (161). PRINCIPLES OF VOCATIONAL GUIDANCE. (3)
This course identifies and applies the underlying principles of guidance to the problems of educational and vocational adjustment of students. (Mietus)

EDIN 462 (169). OCCUPATIONAL ANALYSIS AND COURSE CONSTRUCTION. (3)
Provides a working knowledge of occupational and job analysis and applies the techniques in building and reorganizing courses of study for effective use in vocational and occupational schools. (Chambliss)

EDIN 464 (164). LABORATORY ORGANIZATION AND MANAGEMENT. (3)
This course covers the basic elements of organizing and managing an industrial education program including the selection of equipment and the arrangement of the shop. (Mietus, Beatty)

EDIN 465 (165). MODERN INDUSTRY. (3)
This course provides an overview of manufacturing industry in the American social, economic and culture pattern. Representative basic industries are studied from the viewpoints of personnel and management organization, industrial relations, production procedures, distribution of products, and the like. (Harrison, Chambliss)

EDIN 466 (166). EDUCATIONAL FOUNDATIONS OF INDUSTRIAL ARTS. (3)
A study of the factors which place industrial arts education in any well-rounded program of general education. (Beatty, Luetkemeyer)

EDIN 467 (167). PROBLEMS IN OCCUPATIONAL EDUCATION. (3)
The purpose of this course is to secure, assemble, organize, and interpret data relative to the scope, character and effectiveness of occupational education. (Chambliss)

EDIN 471 (171). HISTORY AND PRINCIPLES OF VOCATIONAL EDUCATION. (3)
An overview of the development of vocational education from primitive times to the present with special emphasis give to the vocational education movement with the American program of public education. (Leutkemeyer)

EDIN 475 (175). RECENT TECHNOLOGICAL DEVELOPMENTS IN PRODUCTS AND PROCESSES. (3)
This course is designed to give the student an understanding of recent technological developments as they pertain to the products and processes of industry. The nature of their newer products and processes is studied as well as their effect upon modern industry and/or society. (Crosby, Mietus)

EDIN 487 (187). FIELD EXPERIENCE IN EDUCATION. (1-4)
See EDUC 489 for description. (Staff)

EDIN 488 (188). SPECIAL PROBLEMS IN EDUCATION. (1-3)
See EDUC 498 for description. (Staff)

EDIN 499 (189). WORKSHOPS, CLINICS AND INSTITUTES. (1-6)
See EDUC 499 for description. (Staff)

FOR GRADUATES

See Graduate School catalog for descriptions.

EDIN 607 (207). PHILOSOPHY OF INDUSTRIAL ARTS EDUCATION. (3) (Leutekemeyer)

EDIN 614 (214). SCHOOL SHOP PLANNING AND EQUIPMENT SELECTION. (3) (Tierney)

EDIN 616 (216). SUPERVISION OF INDUSTRIAL ARTS. (3) (Tierney)

EDIN 620 (220). ORGANIZATION, ADMINISTRATION AND SUPERVISION OF VOCATIONAL EDUCATION. (3) (Chambliss)

EDIN 640 (240). RESEARCH IN INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. (2) (Staff)

EDIN 641 (241). CONTENT AND METHOD OF INDUSTRIAL ARTS. (3) (Maley)

EDIN 642 (242). COORDINATION IN WORK-EXPERIENCE PROGRAMS. (3) (Chambliss)

EDIN 647 (248). SEMINAR IN INDUSTRIAL ARTS AND VOCATIONAL EDUCATION. (2) (Staff)

EDIN 650 (250). TEACHER EDUCATION IN INDUSTRIAL ARTS. (3) (Harrison, Leutkemeyer)

EDIN 798 (288). SPECIAL PROBLEMS IN EDUCATION. (1-6) (Staff)

EDIN 799 (399). THESIS RESEARCH. (Master's Level) (Staff)

EDIN 888 (224). APPRENTICESHIP IN EDUCATION. (1-9) (Staff)

EDIN 889 (287). INTERNSHIP IN EDUCATION. (3-16) (Staff)

EDIN 899 (499). DISSERTATION RESEARCH. (Doctorate Level) (Staff)

LIBRARY SCIENCE EDUCATION

All students anticipating work in library science education should consult with advisors in this area at the beginning of the freshman year. Students enrolled in this curriculum will pursue a Bachelor or Arts degree with an area of concentration of 36 hours in one of the following: humanities, social sciences, science, or foreign languages. Students may concentrate in a subject area subsumed under one of these four fields, or they may choose a broad spectrum of courses in one of the four areas under the guidance of their advisors. The minor of 18 hours will be library science education.

All students who pursue a degree in library science education are required to complete two years (12 semester hours) of the same foreign language on the college level, or the equivalent. Students who have studied French, German or Spanish for two or more years in high school are required to take the Foreign Language Placement Examination before they continue their study of the language concerned. Students who are placed by the examination in French, German or Spanish 114 (the third college semester) are required to

take six additional hours of that language. Students who are placed in French, German or Spanish 115 (the fourth college semester) are required to take three additional hours of that language. Students who are placed in French or Spanish or German 221 (the fifth college semester) are not required to take any further courses in that language. Students who have studied languages other than French, German or Spanish, or who have lived for two or more years in a foreign country where a language other than English prevails, shall be placed by the chairman of the respective language section, if feasible, or by the Chairman of the Department of Foreign Languages. Native speakers of a foreign language shall satisfy the foreign language requirement by taking 12 hours of English.

Students in library science education will complete eight semester hours in Directed Library Experience as their student teaching requirement. It will involve a half day in school, five days per week, for 16 weeks. This period will be divided into two sections, with eight weeks spent in an elementary school and eight weeks in a secondary school. A concurrent weekly seminar will also be a part of this experience. Students completing this curriculum will be eligible for certification as elementary or secondary school librarians.

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition or alternate	3	..
English Literature	..	3
Social Science (Economics, Geography, Government and Politics, Sociology, Psychology, or Anthropology)	3	3
Physical Education	1	1
Art Music, or Philosophy	3	..
MATH 105—Fundamentals of Mathematics	..	4
Science	3	..
Science (with laboratory)	..	4
Foreign Language, or elective if Advanced Placement	3	3
Total	16	18
Sophomore Year		
SPCH 100—Public Speaking	3	..
English Literature	3	..
History requirements	3	3
Foreign Language, or elective if Advanced Placement	3	3
HLTH 105—Science and Theory of Health	..	2
Area of concentration	6	9
Total	18	17
Junior Year		
EDUC 300—Human Development and Learning	6	.
EDUC 370—Introduction to Librarianship	3	..
EDUC 371—Basic Reference and Information Sources	3	..
EDUC 372—Cataloging and Classification of Library Materials	.	3
EDUC 373—Library Materials for Children	.	.
Area of concentration	3	6
Electives	3	6
Total	18	18
Senior Year		
EDUC 301—Foundations of Education	3	..
EDUC 374—Library Materials for Youth	..	3
EDUC 375—School Library Administration and Service	3	..
EDEL 334—Directed Library Experience in Elementary Schools with Seminar and EDSE 371, Directed Library Experience in Secondary Schools with Seminar (4 each)	..	8
Area of concentration	6	6
Electives	6	..
Total	18	17

FACULTY

Evelyn J. Anderson, Margaret E. Chisholm, Evelyn H. Daniel, M. Lucia James.

FOR ADVANCED UNDERGRADUATES

EDUC 370 (EDLS 120). INTRODUCTION TO LIBRARIANSHIP. (3)
An overview of the library profession. Development of public, academic, special and school services. History of books and libraries. The library as a social institution. The impact of communication media on society. Philosophy of librarianship. Professional standards, organizations and publications. (E. Daniel, M. Chisholm)

EDUC 371 (EDLS 122). BASIC REFERENCES AND INFORMATION SOURCES. (3)
Evaluation, selection, and utilization of information sources in subject areas, including encyclopedias, dictionaries, periodical indexes, atlases, yearbooks. Study of bibliographical methods and form. (L. James)

EDUC 372 (EDLS 126). CATALOGING AND CLASSIFICATION OF LIBRARY MATERIALS. (3)
Principles and practice in the organization of library materials. Dewey Decimal Classification, rules for the dictionary catalog, Sears subject headings. Treatment of non-book materials. Cataloging aids and tools. (E. Daniel)

EDUC 373 (EDLS 130). LIBRARY MATERIALS FOR CHILDREN. (3)
Reading interests of children. Advanced study of children's literature. Survey and selection of informational materials in subject fields including: books, periodicals, films, filmstrips, records, pictures, pamphlet materials. (M. Chisholm)

EDUC 374 (EDLS 132). LIBRARY MATERIALS FOR YOUTH. (3)
Reading interests of young people. Literature for adolescents. Selection of informational materials in subject fields including: books, periodicals, films, filmstrips, records. pictures, pamphlet materials. (E. Anderson)

EDUC 375 (EDLS 128) SCHOOL LIBRARY ADMINISTRATION AND SERVICE. (3)
Acquisition, circulation, utilization and maintenance of library materials. Organization of effective school library programs. School library quarters and equipment. Publicity and exhibits. Evaluation of library services. (E. Daniel, M. Chisholm)

EDEL 334 (EDEL 149E). STUDENT TEACHING IN ELEMENTARY SCHOOLS. (Directed Library Experience). (4) (E. Anderson, E. Daniel)

EDSE 371 (EDSE 148). STUDENT TEACHING IN SECONDARY SCHOOLS (Directed Library Experience). (4) (E. Anderson, E. Daniel)

MEASUREMENT AND STATISTICS

FOR ADVANCED UNDERGRADUATES AND GRADUATES

EDMS 410 (EDUC 150). PRINCIPLES OF TESTING AND EVALUATION. (3)
Basic principles including the steps in the specification of instructional objectives and subsequent development

of teacher-made tests; problems in the use and interpretation of achievement and aptitude tests; introduction to the development and use of non-testing evaluation procedures; basic considerations in the assignment of marks and grades; introduction to computer technology as applied to measurement.

EDMS 446 (EDUC 146). QUANTITATIVE RESEARCH METHODS I. (3)
An introduction to research design principles and the scientific method as applied to behavioral phenomena. Instrumentation procedures including the planning and construction of simple data collection instruments and their analysis, and assessment of the reliability and validity of such instruments. Statistical procedures appropriate to the analysis of data from simple research designs. Laboratory experiences in instrumentation and research design are emphasized. (Staff)

EDMS 451 (EDUC 151). INTRODUCTION TO EDUCATIONAL STATISTICS .(3)
Designed as a first course in statistics for students in education. Emphasis is upon educational applications of descriptive statistics, including measures of central tendency, variability and association. Also included are inferential statistics through one-way anova.

EDMS 489 (EDUC 187D). FIELD EXPERIENCES IN MEASUREMENT AND STATISTICS. (1-4)
See EDUC 489 for description.

EDMS 498 (EDUC 188). SPECIAL PROBLEMS IN MEASUREMENT AND STATISTICS. (1-3)
See EDUC 498 for description.

EDMS 499 (EDUC 189D). WORKSHOPS, CLINICS AND INSTITUTES. (1-6)
See EDUC 499 for description.

FOR GRADUATE STUDENTS

See Graduate School catalog for descriptions.

EDMS 622 (EDUC 262). THEORY AND PRACTICE OF STANDARDIZED TESTING. (3)

EDMS 646 (EDUC 246). QUANTITATIVE RESEARCH METHODS II. (3)

EDMS 651. (EDUC 251). INTERMEDIATE STATISTICS IN EDUCATION. (3)

EDMS 681 (EDUC 281). SOURCE MATERIALS IN EDUCATION. (1-2)

EDMS 723 (EDUC 265). MEASUREMENT THEORY I. (3)

EDMS 726 (EDUC 266). PRACTICUM IN INDIVIDUAL TESTING I. (3)

EDMS 769 (EDUC 272). SPECIAL TOPICS IN APPLIED STATISTICS IN EDUCATION. (1-4)

EDMS 771 (EDUC 271). DESIGN OF EXPERIMENTS. (3)

EDMS 780 (EDUC 280). RESEARCH METHODS AND MATERIALS. (3)

EDMS 798 (EDUC 288). SPECIAL PROBLEMS IN MEASUREMENT AND STATISTICS. (1-6)
See EDUC 798 for description.

EDMS 799 (EDUC 399). RESEARCH—MASTER'S THESIS. (1-6)

EDMS 879 (EDUC 290). DOCTORAL SEMINAR. (1-3)

EDMS 888 (EDUC 224D). APPRENTICESHIP IN MEASUREMENT AND STATISTICS. (1-9)

EDMS 889 (EDUC 287D). INTERNSHIP IN MEASUREMENT AND STATISTICS. (3-16)

EDMS 899 (EDUC 499). RESEARCH—DOCTORAL DISSERTATION.

SECONDARY EDUCATION

The Department of Secondary Education is concerned with the preparation of teachers of junior and senior high schools in the following areas: general business, dance, distributive education, English, foreign languages, home economics, mathematics, science, secretarial education, social studies, and speech. In the areas of art and music, teachers are prepared to teach in the elementary, junior and senior high schools. Majors in physical education and agriculture are offered in the College of Physical Education, Recreation and Health and the College of Agriculture in cooperation with the College of Education.

Students enrolled in this curriculum will meet the University general education requirements, plus the following:

All students who pursue the Bachelor of Arts degree in secondary education are required to complete two years (12 semester hours) of the same foreign language on the college level, or the equivalent. If a student has had three years of one foreign language or two years of each of two foreign languages as recorded on his high school transcript, he is not required to take any foreign languages in the college, although he may elect to do so.

If a student has had one year or less of a foreign language in high school, he must complete through Language 112 of a modern foreign language or Language 204 of a classical language.

If a student has had two years of a foreign language in high school, he must complete through the intermediate level of the foreign language of his choice. In the modern languages, French, German and Spanish, he should take the placement test in the language in which he has had work if he wishes to continue the same language; his language instruction would start at the level indicated by the test. With the classical languages, he should start at the level indicated in the catalog.

For students that come under the two immediately preceding paragraphs, the placement test serves also as a proficiency test and may be taken by a student any time (once a semester) to try to fulfill the language requirement.

Students who have studied languages other than French, German or Spanish or who have lived for two or more years in a foreign country where a language other than English prevails, shall be placed by the chairman of the respective language section, if feasible, or by the heads of the foreign language departments. Native speakers of a foreign language shall satisfy the foreign language requirement by taking 12 hours of English.

All students who elect the secondary education curriculum will fulfill the preceding *general* requirements and also prepare to teach one or more school subjects which will involve meeting *specific* requirements in *particular* subject matter fields.

The Bachelor of Arts degree is offered in the teaching fields of art, English, dance, foreign languages, mathematics, social science, and speech. The Bachelor of Science degree is offered in art, business education, home economics, mathematics, music, science, and speech.

ART EDUCATION

Students in art education enroll in one of two programs, elementary or secondary art education. The proposed programs are listed below:

SECONDARY ART EDUCATION CURRICULUM

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition or alternate	3	..
English Literature	..	3
Social Science requirement	3	3
ARTH 100—Introduction to Art	3	..
ARTS 100—Design I	3	..
ARTS 110—Drawing I	..	3
HLTH 105—Science and Theory of Health	..	2
Physical Education	1	1
Foreign Language	3	3
Total	16	15
Sophomore Year		
English Literature	3	..
SPCH 100—Public Speaking	3	..
Foreign Language or electives	3	3
Mathematics	..	3
ARTH 260, 261—Art History	3	3
ARTS 220—Painting I	..	3
DART 170—Stagecraft	3	..
CRAF 220—Ceramics	..	3
Electives in Art	3	3
Total	18	18
Junior Year		
EDUC 300—Human Development and Learning	6	..
History requirements	3	3
Science	3	4
APDS 330—Typography and Lettering	..	3
ARTS 210—Drawing II	..	3
ART 340—Printmaking I	3	..
ART 330—Sculpture I	..	3
Total	15	16
Senior Year		
EDUC 301—Foundations of Education	3	..
Electives	6	..
Electives in Art*	6	..
EDSE 340—Curriculum, Instruction, Observation—Art	..	3
EDUC 440—Audio-Visual Education or Education Elective	..	3
EDSE 330—Principles and Methods of Secondary Education	..	3
EDSE 360—Student Teaching in the Secondary School	..	8
Total	15	17

* Art Electives must be chosen with the approval of the advisor and of the 12 credit hours required in the secondary program at least three must be in crafts.

ELEMENTARY ART EDUCATION CURRICULUM

	Semester I	Semester II
Freshman Year		
English Composition and Literature	3	3
Social Science requirement	3	3
ARTH 100—Introduction to Art	3	..
ARTS 100—Design I or ARTE 100—Fundamentals of Art	3	..
ARTS 110—Drawing I	..	3
HLTH 105—Science and Theory of Health	..	2
Physical Education	1	1
Foreign Language or electives	3	3
Total	16	15
Sophomore Year		
ENGL 202—World Literature or alternate	3	..
Science requirement	3	4
Mathematics	3	..
ARTH 260, 261—Art History	3	3
ARTS 220—Painting I	..	3
SPCH 100—Public Speaking	.3	..
CRAF 220—Ceramics	..	3
Foreign Languages or electives	3	3
Total	18	16
Junior Year		
EDUC 300—Human Development and Learning	6	..
History requirements	3	3
Foreign Language or electives	3	3
ART 330—Sculpture I	..	3
DART 170—Stagecraft	3	..
Electives in Art	..	6
Total	15	15
Senior Year		
CRAF 202—Creative Crafts	3	..
EDUC 301—Foundations of Education	3	..
EDEL 412—Art in the Elementary School	2	..
Electives in Art**	7	..
Electives	3	..
EDEL 322—Curriculum and Instruction	..	3
EDUC 440—Audio-Visual Ed. or Ed. Elective	..	3
EDEL 311—The Child and the Curriculum	..	3
EDEL 332—Student Teaching in the Elementary School	..	8
Total	18	17

** Art Electives must be chosen with the approval of the advisor, and of the 12 credit hours required in the elementary program at least three must be in crafts.

BUSINESS EDUCATION

Three curricula are offered for the preparation of teachers of business subjects. The General Business Education curriculum qualifies for teaching all business subjects except shorthand. Providing thorough training in general business, including economics, this curriculum leads to teaching positions on both junior and senior high school levels.

The Secretarial Education curriculum is adapted to the needs of those who wish to become teachers of shorthand as well as other business subjects.

The Distributive Education curriculum prepares students for vocational teaching requirements in cooperative marketing and merchandising programs.

GENERAL BUSINESS EDUCATION

Freshman Year		
ENGL 101, 201—Composition, and World Literature or alternates	3	3
Fine Arts and Philosophy requirement	3	..
SPCH 100—Public Speaking	..	3
BSAD 110—Elements of Business Enterprise	3	..
GEOG 203—Introduction to Economic Geography	..	3
MATH 110, 111—Introduction to Mathematics	3	3
ECON 100—Economic Developments	3	..

EDSE 100, 101—Principles of Typewriting and Intermediate Typewriting	2	2
Physical Education	1	1
HLTH 105—Science and Theory of Health	..	2
Total	18	17
Sophomore Year		
English Literature	3	..
History requirements	3	3
ECON 201, 203—Principles of Economics	3	3
EDSE 200—Office Typewriting Problems	2	..
Social Science requirement	..	3
EDSE 201—Survey of Office Machines	..	2
BSAD 220, 221—Principles of Accounting	3	3
Science requirements	4 or 3	3 or 4
Total	17 or 18	17 or 18
Junior Year		
EDUC 300—Human Development and Learning	6	..
BSAD 301—Electronic Data Processing	..	3
BSAD 350—Marketing Principles and Organization	3	..
BSAD 380—Business Law	..	3
Elect 300 or 400 level course in Economics	..	3
Electives*	6	6
Total	15	15
Senior Year		
EDUC 301—Foundations of Education	3	..
BSAD 302—Electronic Data Processing Applications	3	..
EDSE 341—Curriculum, Instruction, and Observation—Business Subjects	3	..
EDSE 330—Principles and Methods of Secondary Education	..	3
EDSE 300—Techniques of Teaching Office Skills	..	3
EDSE 361—Student Teaching in the Secondary Schools	..	8
EDSE 415—Financial and Economic Education	3	..
EDSE 416—Financial and Economic Education	3	..
Total	15	14

* A minimum of 55 semester hours of courses in economics, business administration and business education courses are required.

SECRETARIAL EDUCATION

Freshman Year		
ENGL 101, 201—Composition and World Literature or alternates	3	3
Fine Arts or Philosophy requirement	3	..
MATH 110—Introduction to Mathematics	3	..
SPCH 100—Public Speaking	..	3
EDSE 100—Principles of Typewriting (If exempt, BSAD 110)	2	..
EDSE 101—Intermediate Typewriting	..	2
EDSE 102, 103—Principles of Shorthand I, II	3	3
Social Science requirement	..	3
Physical Education	1	1
HLTH 105—Science and Theory of Health	..	2
Total	15	17
Sophomore Year		
ENGL 202—World Literature or alternate	..	3
History requirement	3	3
Science requirement	3 or 4	4 or 3
ECON 201, 203—Principles of Economics	3	3
EDSE 200—Office Typewriting Problems	2	..
EDSE 201—Survey of Office Machines	..	2
EDSE 204—Advanced Shorthand and Transcription	3	..
EDSE 205—Problems in Transcription	..	3
Total	14 or 15	17 or 18
Junior Year		
EDUC 300—Human Development and Learning	6	..
BSAD 220, 221—Principles of Accounting	3	3
EDSE 304—Administrative Secretarial Procedures	..	3
BSAD 380—Business Law	..	3
Electives*	6	6
Total	15	15
Senior Year		
EDUC 301—Foundations of Education	3	..
EDSE 305—Secretarial Office Practice	3	..
BSAD 301—Electronic Data Processing	3	..
EDSE 300—Techniques of Teaching Office Skills	..	3
EDSE 341—Curriculum, Instruction and Observation—Business Subjects	3	..
EDSE 330—Principles and Methods of Secondary Education	..	3
EDSE 361—Student Teaching in Secondary Schools	..	8
Electives—300 or 400 Level	3	3
Total	15	17

DISTRIBUTIVE EDUCATION

FreshmanYear		
ENGL 101, 201—Composition and American Literature or alternate	3	3
ARTH 100—Fine Arts	3	..
MATH 105—Fundamentals of Mathematics	3	..
Science requirement	3	4
BSAD 110—Elements of Business Enterprise	3	..
SPCH 100—Public Speaking	..	3
Social Science requirement	..	3
Health	..	2
PE	1	1
	16	16
Sophomore Year		
History requirement	3	3
ECON 201, 203—Principles of Economics	3	3
BSAD 220, 221—Principles of Accounting	3	3
ENGL 202—World Literature or alternate	3	..
Electives*	3	6
Total	15	15
Junior Year		
BSAD 350—Marketing Principles and Organization	3	..
BSAD 351—Marketing Management	..	3
BSAD 360—Personnel Management I	3	..
BSAD 460—Personnel Management II	..	3
EDUC 300—Human Development and Learning	6	..
EDSE 423—Field Experiences: Distribution	..	3
EDSE 420—Organization and Coordination of DE	..	3
Electives*	6	3
Total	18	15
Senior Year		
EDUC 301—Foundations of Education	3	..
BSAD 380—Business Law	3	..

*Electives	9	..
EDSE 343—Curriculum, Instruction, and Observation: Distributive Education	..	3
EDSE 330—Principles of Secondary Education	..	3
EDSE 363—Student Teaching	..	8
Total	15	14

* A minimum of 55 semester hours of courses in economics, business administration and business education are required.

DANCE EDUCATION

The Dance Education curriculum prepares students for teaching in the public schools, for further graduate study, and for possible teaching in college.

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition or alternate	3	..
ENGL 201—World Literature or alternate	..	3
ZOOL 101—General Zoology	4	..
Social Science Elective	3	..
DANC 102—Rhythmic Invention for Dance	2	..
DANC 100, 104—Dance Techniques	2	2
DANC 200—Introduction to Dance	..	3
MATH 110—Introduction to Mathematics	..	3
HLTH 105—Science and Theory of Health	2	..
History	..	3
DART 120 Acting	..	3
Physical Education	1	1
	17	18
Sophomore Year		
ENGL 202—World Literature or alternate	3	..
MUSC 150—Theory of Music or MUSC 155—Fundamentals for the Classroom Teacher	3	..
ART (Studio or History)	3	..
ZOOL 201—Human Anatomy and Physiology	4	..
DANC 248—Dance Techniques	2	..
DANC 348—Dance Techniques	..	2
DANC 208—Elementary Dance Composition	..	3
Social Science Elective	..	3
MUSC 130—Survey of Music Literature	..	3
ZOOL 202—Human Anatomy and Physiology	..	4
Elective	..	3
PHED 150—Rhythmic Activities	2	..
	17	18
Junior Year		
History	3	..
DANC 470—Creative Dance for Children	3	..
DANC 400—Advanced Choreographic Forms	3	..
Electives	6	..
PHED 400—Kinesiology	..	4
EDUC 300—Human Developmental Learning	..	6
DANC 389—Advanced Modern Dance	..	2
DANC 305—Development of Dance Progression	..	3
Elective	..	3
	15	18
Senior Year		
EDUC 301—Foundations of Education	3	..
DANC—484—Theory and Philosophy of Dance	3	..
DANC 492—Percussion and Music Sources for Dance	3	..
Electives	6	..
EDSE 342—Curriculum, Instruction and Observation	..	3
EDSE 330—Principles and Methods of Secondary Education	..	3
EDSE 362—Student Teaching in Secondary Schools	..	8
	15	14

ENGLISH EDUCATION

A major in English requires 45 semester hours as follows: ENGL 101; 201; 202; 481; 403 or 404 or 405; 430 or 431 or 432 or 433 or 221 or 222; 482; 493; three hours each in a figure, type, and period; six hours electives. Related Fields: SPCH 100 and 240.

Freshman Year		
ENGL 101—Composition	3	..
Social Science requirement	3	3
SPCH 100—Public Speaking	..	3
Foreign Language	3	3
Mathematics requirement	3 or 4	..
Science requirement	..	3 or 4
Physical Education	1	1
Elective	..	3
HLTH 105—Science and Theory of Health	2	..
Total	15 or 16	16 or 17
Sophomore Year		
ENGL 201; 202	3	3
SPCH 240—Oral Interpretation	..	3
History	3	3
Foreign Language	3	3
Science requirement	3 or 4	..
Fine Arts or Philosophy	3	..
Elective	..	3
Total	15 or 16	15
Junior Year		
EDUC 300—Human Development and Learning	..	6
ENGL 403 or 404 or 405	..	3
American Literature	3	..
ENGL 481—Introduction to English Grammar	3	..
ENGL 493—Advanced Expository Writing	3	..
English (period)	..	3
English (type)	3	..
ENGL 482—History of the English Language	..	
Free electives	3	3
Total	15	15
Senior Year		
EDSE 344—Curriculum, Instruction, and Observation	3	..
EDSE 330—Principles and Methods of Secondary Education	3	..
EDSE 453—The Teaching of Reading in the Secondary Schools	3	..
EDSE 364—Student Teaching in Secondary Schools	8	..
ENGL elective (major figure)	..	3
EDUC 301—Foundations of Education	..	3
English electives	..	9
Total	17	15

FOREIGN LANGUAGE EDUCATION

The Foreign Language Education curriculum is designed for prospective foreign language teachers in elementary and secondary schools.

Elementary Education majors are required to have a minimum of 24 semester hours in the foreign language plus EDEL 323, Foreign Language Methods in the Elementary School. College of Arts and Sciences foreign language majors and Secondary Education foreign language majors are also eligible for admission into the FLES program. Interested students should contact the Foreign Language Education advisor in the Department of Secondary Education for further information concerning the requirements for certification of FLES teachers.

CLASSICAL LANGUAGE—LATIN

A minor for teaching Latin requires 24 prescribed semester hours based upon two years of high school Latin. These students should take LATN 203, 204, 305, 351, 352, 361, 401, 402. Students who have had four years of high school Latin should begin with LATN 305 and should select two additional courses from among LATN 403, 404, 405.

Prospective Latin teachers are urged to elect courses which relate to their teaching area: e.g., LATN 170; HIST 271; HIFN 456, 410, 411, 412; ARTH 260; CMLT 401; and ENGL 482.

MODERN FOREIGN LANGUAGES

All prospective foreign language teachers must take a minimum of 42 semester hours in the foreign languages including the following courses which are required for certification: one year of conversation, one year of advanced grammar and composition, one year survey of literature, one year of advanced literature (300 or 400 level) and one year of advanced civilization courses (300 or 400 level) or previously approved equivalents.

Prospective MFL teachers are urged to elect courses related to their teaching area and which will provide an integrated yet broad cultural background: e.g., LATN 170 and basic Latin courses; HIST 231, 232, and HIFN 455 (for Spanish majors); HIST 241, 242, 251, 252; HIFN 424, 425, 432 (for Russian majors); HIFN 444, 433 (for French majors); ARTH 260, 261; ECON 415, 418 (for Spanish majors); ECON 482 (for Russian majors); GVPT 452 (for Spanish majors); CMLT 401, 402.

It is recommended that students who plan to teach a foreign language contact the appropriate Foreign Language Education advisor early in their college career so that they can plan an integrated program of specialization, professional and liberal (general) education.

FOREIGN LANGUAGE IN THE ELEMENTARY SCHOOL CURRICULUM (FLES): See Elementary Education Curriculum.

SECONDARY FOREIGN LANGUAGE EDUCATION

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition or alternate	3	..
ENGL 201—World Literature or alternate	..	3
Social Science requirement	3	3
Science or Mathematics requirements	3 or 4	3 or 4
SPCH 100—Public Speaking	3	..
HLTH 105—Science and Theory of Health	..	2
Physical Education	1	1
Intermediate Foreign Language (or appropriate level as certified by placement test)	3	3
Total	16 or 17	15 or 16
Sophomore Year		
ENGL 202—World Literature or alternate	3	..
History requirements	3	3
Science or Mathematics requirements	3 or 4	3 or 4
Fine Arts or Philosophy requirements	..	3
Foreign Languages—Conversation, Composition, or Literature	3	3
Electives (not in Foreign Languages)	3	3
Total	15 or 16	15 or 16
Junior Year		
EDUC 300—Human Development and Learning	6	..
Foreign Language—Composition and Style	3	3
Foreign Language—Literature	3	3
Foreign Language—Advanced Conversation	3	3
Electives	..	6
Total	15	15
Senior Year		
EDUC 301—Foundations of Education	..	3
EDSE 345—Curriculum, Instruction and Observation	3	..
EDSE 330—Principles and Methods of Secondary Education	3	..
EDSE 365—Student Teaching In the Secondary Schools	8	..
Elective from EDUC 440—Audio-Visual Education, EDMS 410—Educational Measurement, EDEL 425—The Teaching of Reading, EDSE 498—Teaching English as a Second Language, EDSE 499 X-Bi-Lingual Education	2 or 3	..
Foreign Language—Advanced Literature (300 level)	..	6
Foreign Language 331, 332—Civilization*	..	3
Elective in Foreign Language or related area (e.g. Foreign Language, 300 or 400 level, History of France, Introduction Linguistics is recommended)	..	3 or 6
Total	16 or 17	15 or 18

* Courses in related disciplines may be substituted with permission of Cheirman of Foreign Language Department.

HOME ECONOMICS EDUCATION

Students electing this curriculum may be registered in the College of Home Economics or in the College of Education.

The Home Economics Education curriculum is designed for students who are preparing to teach home economics in the secondary schools. It in-

cludes study of each area of home economics and the supporting disciplines.

Fifteen hours of the total curriculum include an area of concentration which must be unified in content and which will be chosen by the student.*

	Semester I	Semester II
Freshman Year		
ENGL 101, 171—Composition or alternate	3	..
SOCY 100—Introduction to Sociology	3	..
FMCD 105—Introduction to Family Living	3	..
FOOD 110—Food and Nutr. of Indiv. and Fam. or NUTR 100—Elements of Nutrition	3	..
MATH requirement	3 or 4	..
PHED	1	1
EDSE 288—Freshman Seminar in Home Ec. Education	1	..
PSYC 100—Introduction to Psychology	..	3
APDS 101—Fundamentals of Design	..	3
ENGL 201—World Literature or alternate	..	3
HLTH 105—Science and Theory of Health	..	2
TEXT 105—Textiles and Clothing in Contemp. Living	..	3
Total	17 or 18	15
Sophomore Year		
ENGL 202—World Literature or alternate	3	..
History	3	..
CHEM 103—College Chemistry I	4	..
HSAD 240—Design and Furnishings in the Home or HSAD 241—Family Housing	3	..
SPCH 100—Public Speaking	3	..
TXAP 221—Apparel I	..	3
History	..	3
CHEM 104—College Chemistry II	..	4
FOOD 200—Scientific Principles of Food	..	3
Fine Arts or Philosophy requirement	..	3
FMCD 250—Decision Making in Family Living	..	3
Total	16	19
Junior Year		
EDUC 300—Human Development and Learning	6	..
FOOD 260—Meal Management	3	..
FMCD 341—Personal and Family Finance or alternative	3	..
Area of concentration	3	..
EDSE 423A Fld Exp (Child Dev Lab)	1	..
FMCD 332—The Child in the Family or EDHD 411—Child Growth and Development	..	3
ECON 205—Fundamentals of Economics	..	3
EDSE 425—Problems in Teaching Home Economics	..	3
ZOOL 101 or MICB 200	..	4
Area of concentration	..	3
Total	16	16
Senior Year		
EDSE 347—Curriculum, Instruction & Observation**	3	..
EDSE 330—Principles & Methods of Secondary Education**	3	..
EDSE 370—Student Teaching in Secondary Schools: Home Economics**	8	..
FMCD 344—Resident Experience in Home Management or FMCD 345D—H.M. Practicum	3	or 3
FMCD 260—Family Relations or SOCY 443 The Family and Society	..	3
EDUC 301—Foundations of Education	..	3
Area of Concentration*	..	9
Total	14-17	15-18

* Area of Concentration: 15 semester hours.
A) Including maximum of two home economics courses, with the remainder of the 15 hours in supporting behavioral, physical and biological sciences, philosophy, special education, or human development.
B) Of the 15 hours, nine must be upper division.
** Student teaching block.

MATHEMATICS EDUCATION

A major in mathematics requires the completion of MATH 241 or its equivalent and a minimum of 15 semester hours of mathematics courses at the 400 level. These 400 level courses must include MATH 403, 450 and one of the geometry courses, 430 or 431. The remainder of the courses in mathematics are to be selected with the approval of the advisor. The major must be supported by one of the following science sequences: CHEM 103 and 104; PHYS 181 and 182 or 221 and 222 or 161 and 262; BOTN 100 and three hours in BOTN courses for which BOTN 100 is a prerequisite; two courses chosen from ZOOL 101, 102, 290, 246, 201 or equivalent; ASTR 110 and 180 and three more hours of astronomy (not including ASTR 100 or 105); MICB 200 plus three hours of microbiology courses.

Freshman Year		
SPCH 100—Public Speaking	3	..
ENGL 101—Composition or alternate	..	3
Fine Arts and Philosophy requirement	..	3
Social Science requirement	3	3
MATH 115, 140—Introductory Analysis and Analysis I	3	4
HLTH 105—Science and Theory of Health	2	..
Physical Education —Physical Activities	1	1
Electives, including Foreign Language	3	3
Total	15	17
Sophomore Year		
ENGL 201, 202—World Literature or alternate	3	3
History requirement	3	3
Science requirement	4	4
MATH 141, 240—Analysis I and Linear Algebra	4	4
Electives	3	3
Total	17	17
Junior Year		
MATH 241—Analysis IV	4	..
MATH 403—Introduction to Abstract Algebra	..	3
Math. electives, including Geometry requirement	3	3
EDUC 300—Human Development and Learning	..	6
Electives	9	3
Total	16	15
Senior Year		
EDSE 330—Principles and Methods of Secondary Education	3	..
EDSE 350—Curriculum, Instruction, and Observation—Mathematics	3	..

EDSE 372—Student Teaching in Secondary Schools—Mathematics	8	..
Education elective	3	..
MATH 450—Fundamental Concepts of Mathematics	..	3
Math. elective	..	3
EDUC 301—Foundations of Education	..	3
Electives	..	6
Total	17	15

MUSIC EDUCATION

The curriculum in music leads to a Bachelor of Science degree in education with a major in music education. It is planned to meet the growing demand for specialists, supervisors and resource teachers in music in the schools. The program provides training in the teaching of vocal and instrumental music and leads to certification to teach music at both elementary and secondary school levels in Maryland and many other states. There are two options. The vocal option is for students whose principal instrument is voice or piano; the instrumental option is for students whose principal instrument is an orchestral instrument.

All students are carefully observed at various stages of their programs by members of the Music Education faculty. This is intended to insure the maximum development and growth of each student's professional and personal competencies. Each student is assigned to an advisor who guides him through the various stages of advancement in the program of music and music education.

INSTRUMENTAL OPTION

	Semester I	Semester II
Freshman Year		
MUSC 108, 109—Applied Music (principal instr.)	2	2
MUSC 131—Introduction to Music	3	..
MUSC 150, 151—Theory of Music	3	3
MUSC 101, 103—Class Piano	2	2
ENGL 101—Composition or alternate	..	3
SPCH 110—Voice and Diction	3	..
Social Science requirements	3	3
MATH 105—Fundamentals of Mathematics or MATH 110—Introduction to Mathematics	..	4 or 3
Total	16	17 or 16
MUSC 129G—Orchestra or MUSC 129—Band	1	1
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
Sophomore Year		
MUSC 208, 209—Applied Music (principal instr.)	2	2
MUSC 250, 251—Advanced Theory of Music	4	4
MUSC 113, 114, 116, 117—Class Study of Instruments (3-4 courses)	2 or 4	2 or 4
ENGL 201, 202—World Literature or alternates	3	3
Biological Science requirement	4	..
Physical Science requirement	..	3
Total	15 or 17	14 or 16
MUSC 229G—Orchestra or MUSC 229I—Band	1	1
MUSC 129—Chamber Music Ensemble (elective)	1	1
Junior Year		
MUSC 408, 409—Applied Music (principal instr.)	2	2
MUSC 330, 331—History of Music	3	3
MUSC 490, 491—Conducting	2	2
MUSC 120, 213—Class Study of Instruments (2 or 3 courses)	2	4 or 2
MUED 410—Methods of Class Instrumental Instruction	..	2
MUED 470—Music in Secondary Schools	2	..
EDUC 300—Human Development and Learning	6	..
Elective	..	3
Total	17	16 or 14
MUSC 329G—Orchestra or MUSC 329I—Band	1	1
MUSC 329—Chamber Music Ensemble (elective)	1	1
Senior Year		
MUSC 418—Applied Music (principal instr.)	2	..
MUSC 100—Class Voice	2	..
MUSC 486—Orchestration	2 or 3	..
MUED 420—Band and Orchestra Techniques and Administration	..	2
EDSE 373, EDEL 335—Student Teaching	..	8
EDUC 301—Foundations of Education	3	..
EDSE 330—Principles and Methods of Secondary Education	3	..
History requirement	3	3
Total	15 or 16	13
MUSC 329G—Orchestra or MUSC 329I—Band	1	1
Musc 329—Chamber Music Ensemble (elective)	1	1

VOCAL OPTION

Freshman Year		
MUSC 108, 109—Applied Music (principal instr.)	2	2
MUSC 131—Introduction to Music	3	..
MUSC 150, 151—Theory of Music	3	3
MUSC 100—Class Voice MUSC 099B, Applied Music (voice)—MUSC 102, 103—Class Piano	2	2
ENGL 101—Composition or alternate	..	3
SPCH 110—Voice and Diction	3	..
Social Science requirement	3	3
MATH 105—Fundamentals of Mathematics or MATH 110—Introduction to Mathematics	..	4 or 3
Total	16	17 or 16
MUSC 129A—Men's Glee Club, MUSC 129B—Women's Chorus, MUSC 129—Chamber Ensemble, or MUSC 129C— University Choir	1	1
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
Sophomore Year		
MUSC 208, 209—Applied Music (principal instr.)	2	2
MUSC 200, 201—Advanced Class Voice	2	2
MUSC 202, 203—Advanced Class Piano	2	2
MUSC 250, 251—Advanced Theory of Music	4	4
ENGL 201, 202—World Literature or alternates	3	3
Biological Science requirement	4	..
Physical Science requirement	..	3
Total	17	16

MUSC 229A—Men's Glee Club, MUSC 229B—Women's Chorus, MUSC 229—Chamber Music Ensemble, or MUSC 229C— University Choir	1	1
Junior Year		
MUSC 408, 409—Applied Music (principal instr.)	2	2
MUSC 110—Class Study of String Instruments, 111—Class Study of Wind Instruments	2	2
MUSC 330, 331—History of Music	3	3
MUSC 490, 491—Conducting	2	2
MUED 462—Music for the Elementary School Specialist	2	..
MUED 470—Music in Secondary Schools	..	2
EDUC 300—Human Development and Learning	..	6
Elective	3	..
Total	14	17
MUSC 329A—Men's Glee Club, MUSC 329B—Women's Chorus, MUSC 329—Chamber Music Ensemble, or MUSC 329C—University Choir	1	1
Senior Year		
MUSC 410—Applied Music (principal instr.)	2	..
MUED 480—The Vocal Music Teacher and School Organization	2	..
MUED 472—Methods and Materials in Vocal Music for Secondary Schools	..	2
EDSE 330—Principles and Methods of Secondary Education	3	..
EDUC 301—Foundations of Education	..	3
EDSE 372, EDEL 335—Student Teaching	4	4
History requirement	3	3
Total	14	12
MUSC 329A—Men's Glee Club, MUSC 329B—Women's Chorus, MUSC 329—Chamber Music Ensemble, or MUSC 329C—University Choir	1	1

FOR ADVANCED UNDERGRADUATES AND GRADUATES

MUED 352 (128). MUSIC FOR THE ELEMENTARY CLASSROOM TEACHER. (2-3)
Prerequisite, MUSC 155 or consent of instructor. For non-music majors. Methods for guiding elementary school students in musical experiences; development of objectives, and a survey of instructional materials. (Staff)

MUED 410 (129). METHODS AND MATERIALS FOR CLASS INSTRUMENTAL INSTRUCTION. (2)
Prerequisite, previous or concurrent registration in MUSC 113-213. Two one-hour laboratories and one lecture per week. Teaching techniques and rehearsal techniques for beginning and intermediate instrumental classes—winds, strings and percussion. (Gallagher, Taylor)

MUED 415 (155). ORGANIZATION AND TECHNIQUE OF INSTRUMENTAL CLASS INSTRUCTION. (3)
Prerequisite, consent of instructor. Practical instruction in the methods of tone production, tuning, fingering, and in the care of woodwind and brass instruments. A survey of the materials and published methods for class instruction. (Staff)

MUED 420 (163). BAND AND ORCHESTRA TECHNIQUES AND ADMINISTRATION. (2-3)
Prerequisites, MUSC 113-213 and 491. Comprehensive study of instructional materials, rehearsal techniques, program planning, and band pageantry for the high school instrumental program. Organization, scheduling, budgeting and purchasing are included. (Gallagher, Taylor)

MUED 428 (180). INSTRUMENTAL MUSIC FOR SECONDARY SCHOOLS. (2)
Prerequisite, consent of instructor. A survey of the repertoires for high school orchestra, band, and small ensemble. Problems of interpretation, intonation, tone quality, and rehearsal techniques. The course may be repeated for credit, since different repertoires are covered each time the course is offered. (Staff)

MUED 430 (170). METHODS AND MATERIALS FOR CLASS PIANO INSTRUCTION. (2)
Objectives, techniques and materials for teaching class piano. Special emphasis is placed on analysis of materials, audio-visual aids, use of electronic pianos, and equipment. (deVermond)

MUED 438 (176). SPECIAL PROBLEMS IN THE TEACHING OF INSTRUMENTAL MUSIC. (2-3)
Prerequisite, MUSC 113-213 or the equivalent. A study, through practice on minor instruments, of the problems encountered in public school teaching of orchestral instruments. Literature and teaching materials, minor repairs, and adjustment of instruments are included. The course may be taken for credit three times since one of four groups of instruments, strings, woodwind, brass or percussion will be studied each time the course is offered. (Staff)

MUED 450 (116). MUSIC IN EARLY CHILDHOOD EDUCATION (3)
First and second semesters. Prerequisite, MUSC 155 or equivalent. Creative experiences in songs and rhythms, correlation of music and everyday teaching with the abilities and development of each level; study of songs and materials; observation and teaching experience with each age level. (Shelley)

MUED 460 (125). CREATIVE ACTIVITIES IN THE ELEMENTARY SCHOOL. (2-3)
Prerequisite, music methods of teaching experience. A study of the creative approach to the development of music experiences for children in the elementary grades emphasizing contemporary music and contemporary music techniques. (Shelley)

MUED 462 (139). MUSIC FOR THE ELEMENTARY SCHOOL SPECIALIST. (2-3)
Prerequisite, consent of instructor. Teaching techniques and instructional materials for the music program in the elementary schools. For the music specialist. (Staff)

MUED 470 (132). MUSIC IN SECONDARY SCHOOLS. (2-3)
Prerequisite, consent of instructor. A study of the music program in the junior and senior high school with emphasis on objectives, organization of subject matter, teaching techniques and materials for general music classes. (Blum, Shelley)

MUED 472 (175). METHODS AND MATERIALS IN VOCAL MUSIC FOR SECONDARY SCHOOLS. (2-4)
Prerequisite, consent of instructor. A survey of repertoire and methods for teaching choral groups and voice classes. Diction, interpretation, tone production, intonation, phrasing rehearsal techniques and style characteristics. (Grentzer, Mueller, Shelley)

MUED 480 (173). THE VOCAL MUSIC TEACHER AND SCHOOL ORGANIZATION. (2)
Prerequisite, student teaching, previous or concurrent. The role of the vocal music specialist in the implementation of the supervision and administration of the music programs in the elementary and secondary schools. Open to graduate students by permission of instructor. (Fanos)

FOR GRADUATES

See Graduate School catalog for descriptions.

MUED 635 (210). ADVANCED ORCHESTRATION AND BAND ARRANGING. (3) (Taylor)

MUED 637 (209). ADVANCED STUDY: DEVELOPING MUSICALITY THROUGH INSTRUMENTAL MUSIC. (3) (Taylor)

MUED 662 (205). ADVANCED STUDY: DEVELOPING MUSICALITY IN CHILDREN. (3) (Blum, Grentzer)
MUED 670 (208). THE TEACHING OF MUSIC APPRECIATION. (3) (Staff)
MUED 672 (207). ADVANCED STUDY: DEVELOPING MUSICALITY IN THE ADOLESCENT. (3) (Blum, Grentzer)
MUED 674 (206). CHORAL CONDUCTING AND REPERTOIRE. (3) (Traver)
MUED 680 (201). ADMINISTRATION AND SUPERVISION OF MUSIC IN THE PUBLIC SCHOOLS. (3) (Taylor)
MUED 690 (200). RESEARCH METHODS IN MUSIC AND EDUCATION. (3) (deVermond, Grentzer)
MUED 692 (202). FOUNDATIONS OF MUSIC EDUCATION. (3) (Taylor)
MUED 697 (204). CURRENT TRENDS IN MUSIC EDUCATION. (3) (deVermond, Grentzer)
MUED 890 (250). HISTORY OF MUSIC EDUCATION IN THE UNITED STATES. (3) (Grentzer)

PHYSICAL EDUCATION AND HEALTH EDUCATION

This curriculum is designed to prepare students for teaching physical education in elementary and secondary schools. To obtain full particulars on course requirements, the student should refer to the section on the College of Physical Education, Recreation and Health.

SCIENCE EDUCATION

A science major consists of 52 semester hours study in the academic sciences.

The following courses are required for all Science Education majors: BOTN 100; CHEM 103; CHEM 104; PHYS 121 or 221 or 161, 122 or 222 or 262 and 263; ZOOL 101; and a year of mathematics. Additional courses are selected from the academic sciences, with the approval of the student's advisor, so as to provide a minimum of 36 hours in a particular science teaching area, e.g., biology, chemistry, physics, and earth sciences, as noted below.

Preparation for biology teaching will include BOTN 202; ZOOL 102; MICB 200; genetics (ZOOL 246 or BOTN 414); a field course in both Botany and Zoology (BOTN 212, 462-464, or 417; ZOOL 470, 480 or ENTM 200).

Preparation for chemistry teaching will include CHEM 103, 104, 201, 202, 203, 204, 481, 482, 498 and upper division courses such as CHEM 321, 401, 403, 421, 440, 461. Math preparation should include MATH 115, 140, 141. MATH 240 and 241 or 246 are also recommended.

Preparation for physics teaching will include math through at least MATH 240, with 241 and 246 also recommended. Physics courses will include introductory physics with calculus (PHYS 221, 222), lab courses (PHYS 285, 286), Intermediate Theoretical Physics 404, 405, and Modern Physics (PHYS 420). In addition, a physics teacher should take course work in Astronomy (110, 180). Participation in PSSC or Harvard Project Physics courses (when offered) would be desirable.

Preparation for earth science teaching will include one year of biology (BOTN 100 and ZOOL 101), one year of chemistry (CHEM 103 and 104), one year of physics (PHYS 221, 222 preferred), MATH 115 and 140, and at least 30 hours of earth sciences with 18 hours concentration in one of the earth science fields and six hours minimum in each of two other earth science areas: GEOL 100, 102, 110, 421, 422, 431, 441, 460, 489, 499; ASTR 100 and 105, 110, 180, 410, 498; GEOG 440, 445, 446, 441, 370, 372, 462.

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition	3	..
BOTN 100—General Botany	4	..
CHEM 103, 104—General Chemistry	4	4
MATH 115—Introductory Analysis, MATH 140—Analysis, MATH 110, 111	3	4
Physical Education	1	1
ZOOL 101—General Zoology	..	4
HLTH 105—Science and Theory of Health	..	2
Total	15	15
Sophomore Year		
English Literature	3	3
History requirement	3	3
PHYS 121, 122—Fundamentals of Physics, or PHYS 221, 222—General Physics: Mechanics, Heat and Sound, or PHYS 161, 262, 263	4 or 5	4 or 5
Science	3 or 4	3 or 4
Arts or Philosophy requirement	..	3
SPCH 100—Public Speaking	3	..
Total	16 or 18	16 or 18
Junior Year		
EDUC 300—Human Development and Learning	..	6
Science and Mathematics	12	9
General Education requirements	3	3
Total	15	18
Senior Year		
EDSE 352—Curriculum, Instruction, and Observation	..	3
EDSE 330—Principles and Methods of Secondary Education	..	3
EDSE 375—Student Teaching in the Secondary Schools	..	8
EDUC 301—Foundations of Education	3	..
Science and Mathematics	12	..
Total	15	14

SOCIAL SCIENCE EDUCATION

OPTION I (HISTORY CONCENTRATION)

Requires 54 semester hours of which at least 27 must be in history, including HIST 221, 222, 241, 242 and 12 hours of 300 or 400-level history courses including HIST 389; 27 hours of related social sciences as outlined below:

At least one course in each of the following area: geography, sociology, (or ANTH 101) government and politics, and two courses in economics. Fifteen semester hours in any one of the following areas: economics, geography, sociology, or government and politics, or psychology. Three of these courses must be on the 300 or 400 level.

OPTION II (GEOGRAPHY CONCENTRATION)

Requires 27 semester hours in geography and 30 semester hours in history and social science. The geography requirements are GEOG 201, 202, GEOG 310 or 490, 6 hours of upper-division systematic geography, and 3 hours of regional geography. The history and social science requirements are: SOCY 100 (or ANTH 101), ECON 110 and 205, GVPT 110, HIST 221, 222, 241, 242, plus two 300 or 400 level history electives. Either option must include one course concerning ethnic or cultural minorities.

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition	..	3
SPCH 100—Public Speaking	3	..
Foreign Languages	3	3
Mathematics requirement	3 or 4	..
Science requirement	..	3 or 4
HIST 221, 222—History of The United States to 1865, History of The United States since 1865	3	3
Fine Arts or Philosophy requirement	..	3
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
Total	15 or 16	16 or 17
Sophomore Year		
English Literature	3	3
HIST 241, 242—Western Civilization	3	3
GEOG 100—Introduction to Geography	3	..
GVPT 170—American Government	..	3
Science requirement	3 or 4	..
Foreign Languages	3	3
SOCY 100—Introduction to Sociology (or ANTH 101)	3	..
ECON 110—Economic Developments	..	3
Total	18 or 19	15
Junior Year		
ECON 205—Fundamentals of Economics	3	..
History electives	3	3
EDUC 300—Human Development and Learning	..	6
History elective (300 or 400 level)	6	3
Social Science electives	3	3
Total	15	15
Senior Year		
EDUC 301—Foundations of Education	3	..
HIST 389—Proseminar in Historical Writing	3	..
Social Science electives	6	..
Electives	3	..
EDSE 353—Curriculum, Instruction and Observation	..	3
EDSE 330—Principles and Methods of Secondary Education	..	3
Elective from EDMS 410; EDUC 440; EDSE 453, 499	..	3
EDSE 376—Student Teaching in Secondary Schools	..	8
Total	15	17

SPEECH EDUCATION

A major in speech requires 37 semester hours. It is the policy to build a program of study in anticipation of the needs of prospective teachers in the communication field of speech and drama. The following speech courses are required: SPCH 100, 200, 110, 220, 350, 325, DART 120, and SPHR 302, plus 15 hours of electives in speech and drama. A teaching minor in English is also recommended. Students desiring a Bachelor of Arts degree also must meet departmental foreign language requirements.

	Semester I	Semester II
Freshman Year		
SPCH 100—Public Speaking	3	..
English Composition	3	..
Social Science requirements	3	3
RATV 124	..	3
Science requirement	3	3
English Literature	3	..
SPCH 110—Voice and Diction	..	3
History requirement	..	3
Physical Education	1	1
HLTH 105—Science and Theory of Health	2	..
DART 110—Introduction to the Theatre	..	3
Total	18	19
Sophomore Year		
English Literature	3	..
SPCH 200—Advanced Public Speaking	..	3
SPCH 220—Group Discussion	..	3
Science requirement	3	..
DART 120—Acting	3	..
SPCH 350—Fundamentals of Speech Communication	3	..
MATH 105—Fundamentals of Mathematics	..	4
History requirement	..	3
Minor requirement	..	3
General elective	3	..
Total	15	16
Junior Year		
DART 311—Play Production	..	3
EDUC 300—Human Development and Learning	6	..
SPHR 302—Handicapped School Children	3	..
Speech electives	3	3
Minor requirements	3	6
SPCH 325—Parliamentary Law	1	..
General electives	..	6
Total	16	18
Senior Year		
DART 330—Play Directing	3	..
EDSE 354—Curriculum, Instruction, and Observation	..	3
EDSE 330—Principles and Methods of Secondary Education	..	3
Elective from EDMS 410, EDUC 440, EDSE 453	..	3
EDSE 377—Student Teaching in Secondary Schools	..	8
SPCH 230—Debate	3	..
Minor requirements	6	..
EDUC 301—Foundations of Education	3	..
General elective	3	..
Total	18	17

FACULTY

Art Education: John Lembach, Edward L. Longley, Jr., Harold McWhinnie.

Business Education: C. R. Anderson, Florence Hall, Robert Peters, Jane O'Neill.

Dance Education: Dorothy Madden.

English Education: Bruce Brigham, John Carr,

Katharine Grimes, Edward James, Leonard Woolf.

Foreign Language Education: William Delorenzo, Solomon H. Flores, Augustine F. Quilici.

Home Economics Education: Elizabeth Brabble, Kinsey Green, Louise Lemmon, Julia Miller.

Mathematics Education: Mildred Cole, Neil Davidson, James Fey, James Henkelman, Henry Walbesser.

Music Education: Beula B. Blum, Mary de Vermond, Stavroula Fanos, Charles Gallagher, Rose Marie Grentzer, Marion Mueller, Shirley J. Shelley, Corwin Taylor, Gustav Wachhaus, Bruce Wilson.

Physical Education (Men): Jerry Wrenn.

Physical Education (Women): Alice M. Love.

Science Education: Marjorie Gardner, Mary Harbeck, John Layman, J. David Lockard, John Maccini, Robert W. Menefee.

Social Studies Education: Arthur Adkins, E. G. Campbell, Joseph Cirrincione, Richard Farrell, Jean Grambs, James Wirth.

Speech Education: Blanton Croft, Barbara Rosenthal, Andrew Wolvin.

EDSE 100 (001). PRINCIPLES OF TYPEWRITING. (2)
Five periods per week. Prerequisite, consent of instructor. The goal of this course is the attainment of the ability to operate the typewriter continuously with reasonable speed and accuracy by the use of the "touch" system. (Staff)

EDSE 101 (002). INTERMEDIATE TYPEWRITING. (2)
Five periods per week. Prerequisite, minimum grade of C in EDSE 100 or consent of instructor. Drills for improving speed and accuracy and an introduction to office production typewriting. This course must be completed prior to enrollment in EDSE 204. (Staff)

EDSE 102, 103 (012, 013). PRINCIPLES OF SHORTHAND. (3, 3)
Prerequisite, consent of instructor. Five periods per week. This course aims to develop the mastery of the principles of Gregg Shorthand. In EDSE 103 special emphasis is placed on developing dictation speed. (O'Neill)

EDSE 200 (010). OFFICE TYPEWRITING PROBLEMS. (2)
Five periods per week. Prerequisite, minimum grade of "C" in EDSE 101 or consent of instructor. A course to develop the higher degree of accuracy and speed possible and to teach the advanced techniques of typewriting and special emphasis on production. (O'Neil)

EDSE 201 (014). SURVEY OF OFFICE MACHINES. (2)
Prerequisite, sophomore standing. The various types of office business machines are surveyed, their capacities and special functions compared. Skill is developed through actual use and demonstration of such machines as: accounting, duplicating, dictating and transcribing, adding and calculating, and other functional types of machines and equipment. The course is designed also to give special training in the handling of practical business problems with machine application (Peters)

EDSE 204 (017). ADVANCED SHORTHAND AND TRANSCRIPTION. (3)
Prerequisite, minimum grade of C in EDSE 101 and consent of instructor. Seven periods per week. Emphasis is placed on vocabulary development and new matter dictation for sustained speed at the highest level possible under varying conditions. Transcription is under timed conditions with emphasis on production involving quantity and quality of finished product. (O'Neill)

EDSE 205 (019). PROBLEMS IN TRANSCRIPTION. (3)
Prerequisite, minimum grade of C in EDSE 204 or consent of instructor. Seven periods per week. A systematic development of recording skills under special and office-style dictation and transcription conditions with particular emphasis on transcriptional problems. (O'Neill)

EDSE 288 (88). SPECIAL PROBLEMS IN EDUCATION (1-6)
See EDUC 288 for description.

EDSE 300 (100). TECHNIQUES OF TEACHING OFFICE SKILLS (3)
First semester. An examination and evaluation of the aims, methods, and course contents of each of the office skill subjects offered in the high school curriculum. (Peters)

EDSE 304 (100). ADMINISTRATIVE SECRETARIAL PROCEDURES. (3)
Prerequisite, EDSE 204 and 205 or consent of the instructor. The nature of office work, the secretary's function in communication, inter-company and public relations, handling records, supplies and equipment; and in direction of the office staff. Standardization and simplification of office forms and procedures in relation to correspondence, mailing, receiving callers, telephoning, handling conferences, and securing business information. Business etiquette and ethics. (O'Neill)

EDSE 305 (112). SECRETARIAL OFFICE PRACTICE. (3)
Six periods per week. Prerequisite, senior standing and completion of EDSE 304. The purpose of this course is to give laboratory and office experience to senior students. A minimum of 90 hours of office of experience under supervision is required. In addition, each student will prepare a written report on an original problem previously approved. (Peters)

EDSE 330 (145). PRINCIPLES AND METHODS OF SECONDARY EDUCATION. (3)
First and second semesters; summer session. This course is concerned with the principles and methods of teaching in junior and senior high schools. Instructional problems common to all of the subject fields are considered in relation to the needs and interests of youth, the urgent social problems of today, and the central values to which our society is committed. (Adkins, Funaro)

EDSE 340-354 (140). CURRICULUM, INSTRUCTION AND OBSERVATION. (3)
First and/or second semesters. Offered in separate sections for the various subject matter areas namely: art (340), business (341), dance (342), distributive (343), English (344), foreign language (345), geography (346), home economics (347), mathematics (350), music (351), science (352), social studies (353), and speech (354). Registration cards must include the subject-matter area as well as the name and number of the course. The objectives, selection and organization of subject matter, appropriate methods, lesson plans textbooks, and other instructional materials, measurement, and other topics pertinent to the particular subject matter area are treated. Twenty periods of observation. Students must reserve all day each Tuesday for observation in public schools. (Staff)

EDSE 360 377 (148). STUDENT TEACHING IN SECONDARY SCHOOLS. (2-8)
First and second semesters. In order to be admitted to a course in student teaching, a student must have a doctor's certificate indicating that the applicant is free of communicable diseases, and the consent of the instructor to the appropriate area. He must have been previously enrolled at the University of Maryland for at least one semester. Undergraduate credit only. The areas are as follows: art (360), business (361), dance (362), distributive (363), English (364), foreign language (365), geography (366), health (367), home economics (370), library (371), mathematics (372), music (373), physical (374), science (375), social studies (376), and speech (377). Application forms for this course must be submitted to the appropriate advisor by the middle of the semester

preceding the one in which an assignment is desired. Students who register for this course serve as apprentice teachers in the schools to which they are assigned. For 8 credits, full time for one-half of the semester is devoted to this work. For experienced teachers and students in physical education, music education, and library science education who are planning to split student teaching assignment in elementary and secondary schools, the time and credit may be modified. Student teaching is a full-time commitment. Consequently, interference with this commitment due to employment is not permitted. Transportation to the school(s) assigned for student teaching is the responsibility of the student. (Staff)

EDSE 402 (102). METHODS AND MATERIALS IN TEACHING BOOKEEPING, AND RELATED SUBJECTS. (3)
Important problems and procedures in the mastery of bookkeeping and related office knowledge and the skills including a consideration of materials and teaching procedures. (Peters)

EDSE 403 (101). PROBLEMS IN TEACHING OFFICE SKILLS. (3)
Problems in development of occupational competency, achievement tests, standards of achievement, instructional materials, transcription, and the integration of office skills. (Peters)

EDSE 404 (104). BASIC BUSINESS EDUCATION IN THE SECONDARY SCHOOLS. (3)
Includes consideration of course objectives; subject matter selection; and methods of organization and presenting business principles, knowledge and practices. (Peters)

EDSE 415, 416 (114, 115). FINANCIAL AND ECONOMIC EDUCATION. (3, 3)
Materials, resources and methods of teaching personal finances and economics in the public schools. Special attention will be directed toward the problems of teaching the consumer's role in relation to his earnings and spending power, and the need for intelligent planning and handling of personal and family resources. (Anderson)

EDSE 420 (120). ORGANIZATION AND COORDINATION OF DISTRIBUTIVE EDUCATION PROGRAMS. (3)
This course deals specifically with such areas as the organization of a cooperative distributive education program; the development of an effective cooperative relationship between coordinator and training sponsor; the selection, orientation, and training of sponsors; analysis of training opportunities, reports and records; the evaluation and selection of students for part-time cooperative work assignments; and the evaluation of the program. (Anderson)

EDSE 421 (121). METHODS AND MATERIALS IN DISTRIBUTIVE EDUCATION. (3)
This course covers basic methods and materials needed to teach the preparatory classroom related instruction of a one or two year distributive education program. It deals specifically with the organization of special supplementary materials for individual and group instruction—Youth Club programs, organization and administration. (Anderson)

EDSE 423 (123) FIELD EXPERIENCES IN VOCATIONAL AREAS: (a) HOME ECONOMICS EDUCATION; (b) BUSINESS EDUCATION; (c) DISTRIBUTIVE EDUCATION.
First and second semesters and summer session. Supervised work experience in an occupation related to vocational education. Application of theory to work situations as a basis for teaching in vocational education programs. By individual arrangement with adviser. (Anderson)

EDSE 425 (125C). PROBLEMS IN TEACHING HOME ECONOMICS. (3)
First and second semesters. Prerequisite, EDSE 347. A study of the managerial aspects of teaching and administering a home-making program; the physical environment, organization, and sequence of instructional units, resource materials, evaluation, home projects. (Green, Lemmon)

EDSE 426 (126). EVALUATION OF HOME ECONOMICS. (3)
The meaning and function of evaluation in education; the development of a plan for evaluating a homemaking program with emphasis upon types of evaluation devices, their construction and use. (Green, Lemmon)

EDSE 430 (EDUC 157). CORRECTIVE REMEDIAL READING INSTRUCTION. (3)

EDSE 431 (EDUC 155). LABORATORY PRACTICE IN READING. (2-4)

EDSE 432 (130). THE JUNIOR HIGH SCHOOL. (2-3)
A general overview of the junior high school. Purposes, functions and characteristics of this school unit; a study of its population, organization, program of studies, methods, staff, and other topics, together with their implications for prospective teachers. (Adkins, Grambs)

EDSE 434 (134). MATERIALS AND PROCEDURES FOR THE SECONDARY SCHOOL CORE CURRICULUM. (3)
This course is designed to bring practical suggestions to teachers who are in charge of core classes in junior and senior high schools. Materials and teaching procedures for specific units of work are stressed. (Grambs)

EDSE 440 (141). METHODS OF TEACHING ENGLISH IN SECONDARY SCHOOLS. (3)
Content and method in teaching the English language arts. (Carr, Woolf)

EDSE 442 (142). TEACHING THE AUDIO-LINGUAL SKILLS IN FOREIGN LANGUAGES. (3)
Graduate credit allowed by special arrangement and advisor's approval. Designed for high school teachers. Methods in making and using tape recordings, using electronic laboratories, developing oral-aural skills and direct approach to language teaching are emphasized. (Flores)

EDSE 444 (137). METHODS OF TEACHING MATHEMATICS IN SECONDARY SCHOOLS. (3)
Considers the methods and procedures for presenting secondary mathematics in a meaningful way. Special attention will be given to the new experimental materials which have been prepared for grades 7-12 and the techniques needed to teach these courses. (Henkelman)

EDSE 446 (138). METHODS OF TEACHING SCIENCE IN SECONDARY SCHOOLS. (3)
Considers such topics as the objectives, selection, organization, and presentation of subject matter, appropriate classroom methods and procedures, instructional materials and evaluation of learning experiences in the areas of science. (Lockard)

EDSE 447 (133). METHODS OF TEACHING SOCIAL STUDIES IN SECONDARY SCHOOLS. (2-3)
Designed to give practical training in the everyday teaching situations. Use of various lesson techniques, audio and visual aids, reference materials, and testing programs and the adaptation of teaching methods to individual and group differences. Present tendencies and aims of instruction in the social studies. (Farrell, Campbell)

EDSE 450 (139). SPEECH METHODS AND RESOURCES IN SECONDARY SCHOOLS. (3)
Practical suggestions for developing curricular and extra-curricular speech programs. Planning units and courses of study, current trends, and aims of speech education, use of printed and audio-visual materials, evaluating of performance, directed speech activities, and the teaching of listening. (Wolvin)

EDSE 453 (EDEL 153C). THE TEACHING OF READING IN THE SECONDARY SCHOOL (3)

EDSE 489 (187). FIELD EXPERIENCE IN EDUCATION. (1-4)
See EDUC 489 for description. (Staff)

EDSE 498 (188.) SPECIAL PROBLEMS IN EDUCATION. (1-3)
See EDUC 498 for description. (Staff)

EDSE 499 (189). WORKSHOPS, CLINICS, AND INSTITUTES. (1-6)
See EDUC 499 for description. (Staff)

FOR GRADUATES

See Graduate School catalog for course descriptions.

EDSE 600 (200). ADMINISTRATION AND SUPERVISION OF BUSINESS EDUCATION. (3) (Peters)

EDSE 605 (255). PRINCIPLES AND PROBLEMS OF BUSINESS EDUCATION. (2-3) (Peters)

EDSE 606 (256). CURRICULUM DEVELOPMENT IN BUSINESS EDUCATION. (2-3) (Peters)

EDSE 626 (253). PROBLEMS OF TEACHING READING IN SECONDARY SCHOOL. (Staff)

EDSE 630 (EDUC 257). DIAGNOSIS AND REMEDIATION OF READING DISABILITIES (3)

EDSE 631 (EDUC 255). ADVANCE LABORATORY EXPERIENCE IN READING INSTRUCTION (3)

EDSE 632 (256). CURRICULUM DEVELOPMENT IN BUSINESS EDUCATION. (2-3) (Peters)

EDSE 637 (239). SEMINAR IN SECONDARY EDUCATION. (3) (Risinger, Adkins, McClure)

EDSE 640-647, 650-653 (240). TRENDS IN SECONDARY SCHOOL CURRICULUM. (3) (Staff)

EDSE 700, 701 (275, 276). ADVANCED PROBLEMS IN ART EDUCATION. (3) (Staff, Longley)

EDSE 705 (261). TRENDS IN THE TEACHING AND SUPERVISION OF HOME ECONOMICS. (3) (Green, Lemmon)

EDSE 740-747, 750-754. (243). THEORY AND RESEARCH IN SECONDARY EDUCATION. (1-3) (Staff)

EDSE 798 (288). SPECIAL PROBLEMS IN EDUCATION. (1-6) (Staff)

EDSE 799 (399). THESIS RESEARCH. (Master's Level) (Staff)

EDSE 820-827, 830-834 (247). SEMINAR IN SPECIAL SUBJECT AREAS. (3) (Staff)

EDSE 888 (224). APPRENTICESHIP IN EDUCATION. (1-9) (Staff)

EDSE 889 (287). INTERNSHIP IN EDUCATION. (3-16) (Staff)

EDSE 899 (499). DISSERTATION RESEARCH. (Doctorate Level) (Staff)

SPECIAL EDUCATION

The Special Education Department offers an undergraduate program which prepares students for a teaching position in either an elementary or secondary level special education program. Students who complete the undergraduate program receive the Bachelor of Science degree and meet Maryland State Department of Education requirements for the standard professional certificate in special education and elementary education.

Students at the undergraduate level pursue a sequential program in the broad area of learning differences, concentrating either in the area of the mentally retarded, learning disabilities (perceptually impaired) or the gifted. Field experiences are required of all students in the department prior to their student teaching experiences. An area of academic content consisting of 15 credit hours beyond the General Education Requirement in an area is included in each student's program. These areas of concentration may be developed in and among the areas of psychology, sociology, anthropology, and speech and hearing. Students interested in the gifted have a program developed for them in conjunction with offerings in early childhood-elementary education or secondary education and their academic field.

A minimum of 129 semester hours plus the four required hours in health and physical education are necessary for graduation.

Each undergraduate student is assigned a faculty advisor. The student consults with his advisor regarding specific details of his program, alternatives, etc. The following represents a "typical" program.

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition or alternate	3	..
English Literature	..	3
PSYCH 100—Introduction to Psychology	..	3
SOCY 100—Introduction to Sociology	3	..
GEOG 100—Introduction to Geography	..	3
ARTE 100—Fundamentals of Art Education	3	..
MUSC 155—Fundamentals for the Classroom Teacher	..	3
Biological Sciences	3 or 4	..
Physical Education	1	1
HEALTH	2	..
FINE ARTS (Art, Dance, Music, Philosophy)	..	3
	15 or 16	16
Sophomore Year		
English Literature	3	..
U. S. History	3	..
History	..	3
Physical Science	3 or 4	..
SCIENCE (Physical or Biological)	..	3 or 4
MATH 210—Elements of Mathematics	4	
MATH 211—Elements of Geometry	..	4
SPHR 202—Fundamentals of General American Speech or SPCH 100— Public Speaking, or SPCH 110—Voice and Diction	..	3
Area of concentration or elective	3	3
	16 or 17	16 or 17
Junior Year		
HISTORY	..	3
EDUC 300—Human Development and Learning	6	..
EDEL 302—Science in the Elementary School	2	..
EDEL 326—The Teaching of Reading	2	..
EDEL 405—Language Arts in the Elementary School	..	2
EDEL 407—Social Studies in the Elementary School	..	2
EDEL 414—Mathematics in the Elementary School	..	2
EDSP 470—Introduction to Special Education	3	..
EDSP 471, 481, 491—Characteristics of Exceptional Children 471—Mentally Retarded or 481—Gifted or 491—Learning Disabilities (Perceptually Impaired)	..	3
Electives, Area of concentration	3	3
	16	15
Senior Year		
EDUC 301—Foundations of Education	3	..
PHED 420—Physical Education in the Elementary Schools (3) or EDMU 352—Music for the Elementary Classroom Teacher (2) or EDEL 412—Art in the Elementary School (2)	2 or 3	..
EDSP 473, 483, 493—Curriculum for Exceptional Children 472—Mentally Retarded or 482—Gifted or 492—Learning Disabilities (Perceptually Impaired)	3	..

EDSP 473, 483—Curriculum for Exceptional Children 473—Mentally Retarded or 483—Gifted or 493—Learning Disabilities (Perceptually Impaired)	3	
EDEL 333—Student Teaching in the Elementary School		8
EDSP 349—Student Teaching of Exceptional Children		8
Electives, Area of concentration	6	
	17 to 18	16

Students interested in graduate programs (Masters, Advanced Graduate Specialists and Doctoral) in special education are requested to consult the Graduate School catalog and the Department of Special Education concerning programs and advisors.

FACULTY

Samuel C. Ashcroft, Jean R. Hebeler, Mildred Holt. M. Dean Hoops, Linda Jacobs, William Porter, Eric Seidman, Betty H. Simms.

EDSP 288 (088). SPECIAL PROBLEMS IN SPECIAL EDUCATION. (1-6)
Prerequisite, consent of special education advisor. Available only to freshmen and sophomore students who have definite plans for individual study of approved problems relative to their preparation for teaching. Course cards must have the title of the problem and the name of the faculty member who has approved it. (Staff)

EDSP 349 (149). STUDENT TEACHING OF EXCEPTIONAL CHILDREN. (8)
A doctor's certificate indicating freedom from communicable diseases and approval of department required. Undergraduate credit only. Students in special education enroll in 8 credits of EDSP 349 for 8 weeks and 8 credits of EDEL 333 for 8 weeks during the same semester. No other courses may be taken during a full semester of student teaching. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

EDSP 470 (170). INTRODUCTION TO SPECIAL EDUCATION. (3)
Designed to give an understanding of the needs of all types of exceptional children, stressing preventive and remedial measures. (Staff)

EDSP 471 (171A). CHARACTERISTICS OF EXCEPTIONAL CHILDREN—MENTALLY RETARDED. (3)
Prerequisite, EDSP 470 or equivalent. Studies the diagnosis, etiology, physical, social and emotional characteristics of exceptional children. (Staff)

EDSP 472 (172A). EDUCATION OF EXCEPTIONAL CHILDREN—MENTALLY RETARDED. (3)
Prerequisite, EDSP 471 or equivalent. Offers practical and specific methods of teaching exceptional children. Selected observation of actual teaching may be arranged. (Staff)

EDSP 473 (173A). CURRICULUM FOR EXCEPTIONAL CHILDREN—MENTALLY RETARDED. (3)
Prerequisite, EDSP 471 or equivalent. Examines the principles and objectives guiding curriculum for exceptional children; gives experience in developing curriculum; studies various curricula currently in use. (Staff)

EDSP 475 (175) EDUCATION OF THE SLOW LEARNER. (3)
Course content includes the characteristics of the slow learner and those educational practices which are appropriate for the child who is functioning as a slow learner. (Staff)

EDSP 481 (171B). CHARACTERISTICS OF EXCEPTIONAL CHILDREN—GIFTED. (3)
Prerequisite, EDSP 470 or equivalent. Studies the diagnosis, etiology, physical, social, and emotional characteristics of exceptional children. (Staff)

EDSP 482 (172B). EDUCATION OF EXCEPTIONAL CHILDREN—GIFTED. (3)
Prerequisite, EDSP 481 or equivalent. Offers practical and specific methods of teaching exceptional children. Selected observation of actual teaching may be arranged. (Staff)

EDSP 483 (173B). CURRICULUM FOR EXCEPTIONAL CHILDREN—GIFTED. (3)
Prerequisite, EDSP 481 or equivalent. Examines the principles and objectives guiding current curriculum for exceptional children; gives experience in developing curriculum; studies various curricula currently in use. (Staff)

EDSP 489 (187). FIELD EXPERIENCE IN SPECIAL EDUCATION. (1-4)
See EDUC 489 for description. (Staff)

EDSP 491 (171C). CHARACTERISTICS OF EXCEPTIONAL CHILDREN—PERCEPTUAL LEARNING PROBLEMS. (3)
Prerequisite, EDSP 470 or equivalent. Studies the diagnosis, etiology, physical, social, and emotional characteristics of exceptional children. (Staff)

EDSP 492 (172C). EDUCATION OF EXCEPTIONAL CHILDREN—PERCEPTUAL LEARNING PROBLEMS. (3)
Prerequisite, EDSP 491 or equivalent. Offers practical and specific methods of teaching exceptional children. Selected observation of actual teaching may be arranged. (Staff)

EDSP 493 (173C). CURRICULUM FOR EXCEPTIONAL CHILDREN—PERCEPTUAL LEARNING PROBLEMS. (3)
Prerequisite, EDSP 491 or equivalent. Examines the principles and objectives guiding curriculum for exceptional children; gives experience in developing curriculum; studies various curricula currently in use. (Staff)

EDSP 498 (188). SPECIAL PROBLEMS IN SPECIAL EDUCATION. (1-3)
See EDUC 498 for description. (Staff)

EDSP 499 (189). WORKSHOPS, CLINICS, AND INSTITUTES. (1-6)
See EDUC 499 for description.

FOR GRADUATES

See Graduate School catalog for descriptions.

EDSP 600 (200). EXCEPTIONAL CHILDREN AND YOUTH. (3) (Staff)

EDSP 601 (201). EMOTIONALLY HANDICAPPED CHILDREN AND YOUTH. (3) (Staff)

EDSP 605 (205). THE EXCEPTIONAL CHILD AND SOCIETY. (3) (Staff)

EDSP 610 (210). ADMINISTRATION AND SUPERVISION OF SPECIAL EDUCATION PROGRAMS. (3) (Staff)

EDSP 615 (215). EVALUATION AND MEASUREMENT OF EXCEPTIONAL CHILDREN AND YOUTH. (3) (Staff)

EDSP 620 (220). EDUCATIONAL DIAGNOSIS AND PLANNING FOR EXCEPTIONAL CHILDREN AND YOUTH. (3) (Staff)

EDSP 621 (221). PSYCHO-EDUCATIONAL PROGRAMMING WITH EMOTIONALLY HANDICAPPED CHILDREN AND YOUTH. (3) (Staff)

EDSP 625 (225). PROBLEMS IN THE EDUCATION OF THE MENTALLY RETARDED. (3) (Staff)

EDSP 630 (230). PROBLEMS IN THE EDUCATION OF THE GIFTED. (3) (Staff)

EDSP 635 (235). PROBLEMS IN THE EDUCATION OF CHILDREN WITH EMOTIONAL DISTURBANCES. (3) (Staff)

EDSP 640 (240). PROBLEMS IN THE EDUCATION OF CHILDREN WITH PERCEPTUAL IMPAIRMENT. (3) (Staff)

EDSP 678 (278). SEMINAR IN SPECIAL EDUCATION. (2) (Staff)

EDSP 798 (288). SPECIAL PROBLEMS IN SPECIAL EDUCATION. (1-6) (Staff)

EDSP 799 (399). THESIS RESEARCH. (Master's Level) (Staff)

EDSP 888 (224). APPRENTICESHIP IN SPECIAL EDUCATION. (1-9) (Staff)

EDSP 889 (287). INTERNSHIP IN SPECIAL EDUCATION. (3-16) (Staff)

EDSP 899 (499). DISSERTATION RESEARCH. (Doctorate Level) (Staff)

THE INSTITUTE FOR CHILD STUDY

The Institute for Child Study carries on the following activities: (1) It undertakes basic research in human development; (2) It synthesizes research findings from many sciences that study human beings; (3) It plans, organizes and provides consultant service programs of direct child study by in-service teachers in individual schools or in municipal, county or state systems; (4) It offers course programs and field training to qualified graduate students, preparing them to render expert consultant service to schools and for college teaching of human development. (For graduate course descriptions and sequences, refer to Graduate School catalog.)

Undergraduate courses and workshops are designed for prospective teachers, in-service teachers and other persons interested in human development. Certain prerequisities are set up within the course sequences, but these prerequisites are modified by the student's previous experience in direct study of children.

HUMAN DEVELOPMENT EDUCATION

FOR ADVANCED UNDERGRADUATES AND GRADUATES

EDHD 306 (106). A STUDY OF HUMAN BEHAVIOR. (3)
This course is planned for and limited to students who are not enrolled in the College of Education, and it does not satisfy the requirements of the professional teacher education programs. The course is designed to introduce students to the scientific principles (physical, social and psychological) which describe human behavior, development and adjustment at all maturity levels and to use these principles in the study of individual children and youth. Each student will observe, record, and analyze the behavior of an individual throughout the semester and must have one half-day a week for this purpose. (Bowie, Mershon)

EDHD 312, 314 (112, 114). SCIENTIFIC CONCEPTS IN HUMAN DEVELOPMENT I, II. (3, 3)

EDHD 313, 315 (113, 115). LABORATORY IN BEHAVIOR ANALYSIS I, II. (3, 3)

EDHD 402, 403, 404 (102, 103, 104). CHILD DEVELOPMENT LABORATORY I, II and III. (2, 2, 2)
These courses involve the direct study of children throughout the school year. Each participant gathers a wide body of information about an individual, presents the accumulating data from time to time to the study group for criticism and group analysis and writes an interpretation of the dynamics underlying the child's learning behavior and development. Provides opportunity for teachers in service to earn credit for participation in their own local child study group. (Staff)

EDHD 411 (108). CHILD GROWTH AND DEVELOPMENT. (3)
Growth and development of the child from conception through the early childhood years, with emphasis on developmental sequences in physical, psychological and social areas. Implications for understanding and working with young children in the home, school, and in other settings. (Staff)

EDHD 413 (105). ADOLESCENT DEVELOPMENT. (3)
A study of the interplay of physical, cultural and self forces as they influence behavior, development, learning, and adjustment during adolescence. Includes observation and case study. This course cannot be used to meet the psychological foundations requirements for teacher certification. (Gardner)

EDHD 416 (116). SCIENTIFIC CONCEPTS IN HUMAN DEVELOPMENT III. (3)
Guided reading and observation of pupils throughout the school year. Emphasis on human development concepts relating to impact of family, school, society, and peer group on the student. Collection and analysis of data affecting learning and behavior. For in-service educators. (Staff)

EDHD 417 (117). LABORATORY IN BEHAVIOR ANALYSIS III. (3)
Prerequisite, EDHD 416. Guided reading and observation of pupils throughout the school year. Emphasis on analysis of intrinsic aspects of learning and behavior including cognitive processes, motivation, self-concept, attitudes, and values. For in-service educators. (Staff)

EDHD 420, 421, 422 (120, 121, 122). STUDY OF HUMAN DEVELOPMENT AND LEARNING IN SCHOOL SETTINGS I, II, III. (2, 2, 2)
A sequence of courses which enables in-service teachers and administrators to carry on advanced study of human development and learning principles in the continuous study and evaluation of several different phases of the school program over an extended period of time.

EDHD 445 (145). GUIDANCE OF YOUNG CHILDREN. (3)
Development of an appreciation and understanding of young children from different home and community backgrounds; study of individual and group problems.

EDHD 460 (160). EDUCATIONAL PSYCHOLOGY. (3)
Prerequisites, PSYC 100 or EDUC 300 or equivalent. Offers an examination of research and problems in educational psychology. Includes consideration of measurement and the significance of individual differences, learning, motivation and emotions, transfer of learning, intelligence, attitudes, problem solving; understanding and thinking, and communicating knowledge. The course is intended to provide an overview of educational psychology with an emphasis on learning processes. It may not be substituted for EDUC 300 by regularly matriculated students in the teacher education program.

EDHD 489 (187). FIELD EXPERIENCE IN EDUCATION. (1-4)
See EDUC 489 for description. (Staff)

EDHD 498 (188). SPECIAL PROBLEMS IN EDUCATION. (1-3)
See EDUC 498 for description. (Staff)

EDHD 499 (189). WORSHOPS, CLINICS, AND INSTITUTES. (1-6)
See EDUC 499 for description. (Staff)

FOR GRADUATES

See *Graduate School catalog* for descriptions.

EDHD 600 (200). INTRODUCTION TO HUMAN DEVELOPMENT AND CHILD STUDY. (3) (Flatter, Kurtz, Kyle, Thompson)

EDHD 601 (201). BIOLOGICAL BASES OF BEHAVIOR. (3) (Chapin, Matteson)

EDHD 602 (202). SOCIAL BASES OF BEHAVIOR. (3) (Davidson, Hardy)

EDHD 603 (203). INTEGRATIVE BASES OF BEHAVIOR. (3) (Bolea, Green)

EDHD 612, 614, 616 (212, 214, 216). ADVANCED CONCEPTS IN HUMAN DEVELOPMENT I, II, and III. (3, 3, 3)

EDHD 613, 615, 617 (213, 215, 217). ADVANCED LABORATORY IN BEHAVIOR ANALYSIS I, II, and III. (3, 3, 3)

EDHD 659 (250). DIRECT STUDY OF CHILDREN. (1) (Staff)

EDHD 710 (210). AFFECTIONAL RELATIONSHIPS AND PROCESSES IN HUMAN DEVELOPMENT. (3) (Hatfield)

EDHD 711 (211). PEER-CULTURE AND GROUP PROCESSES IN HUMAN DEVELOPMENT. (3) (Hatfield)
EDHD 721 (221). LEARNING THEORY AND THE EDUCATIVE PROCESS I. (3) (Bolea, McDaniels, Milhollan, Perkins)
EDHD 722 (222). LEARNING THEORY AND THE EDUCATIVE PROCESS II. (3) (Elliot)
EDHD 730, 731 (230, 231). FIELD PROGRAM IN CHILD STUDY II. (2-6) (Kurtz, Morgan)
EDHD 779 (270). SEMINARS IN SPECIAL TOPICS IN HUMAN DEVELOPMENT. (2-6) (Davidson, Huebner)
EDHD 798 (288). SPECIAL PROBLEMS IN EDUCATION. (1-6)
See EDUC 798 for description. (Staff)
EDHD 799 (399). THESIS RESEARCH. (Master's Level)
See EDUC 799 for description. (Staff)
EDHD 810, 811 (204, 205). PHYSICAL PROCESSES IN HUMAN DEVELOPMENT. (3, 3) (Bennett, Chapin)
EDHD 820, 821 (206, 207). SOCIALIZATION PROCESSES HUMAN DEVELOPMENT. I, II. (3, 3) (Hunt, Kurtz, Matteson, Mershon)
EDHD 830, 831 (208, 209). SELF PROCESSES IN HUMAN DEVELOPMENT I and II. (3, 3) (Bowie, Goering, Mershon, Rogolsky)
EDHD 860 (260). SYNTHESIS OF HUMAN DEVELOPMENT CONCEPTS. (3) (Morgan)
EDHD 888 (224). APPRENTICESHIP IN EDUCATION. (1-9) (Staff)
EDHD 889 (287). INTERNSHIP IN EDUCATION. (3-16) (Staff)
EDHD 899 (499). DISSERTATION RESEARCH. (Doctorate Level)
See EDUC 899 for description. (Staff)

ADMINISTRATION, SUPERVISION AND CURRICULUM

The programs in the Department of Administration, Supervision and Curriculum are all at the graduate level and include preparation of school superintendents, principals, supervisors, curriculum directors, and administrative specialists in the areas of finance and business administration, personnel administration, public relations, and educational facilities. In addition, there are programs for the preparation of professors and research workers in all of the above areas. Preparation programs leading to administrative positions in junior colleges and other institutions of higher learning are available through a joint major in administration-higher education.

EDAD 489 (187). FIELD EXPERIENCE IN EDUCATION. (1-4)
See EDUC 489 for description. (Staff)
EDAD 498 (188). SPECIAL PROBLEMS IN EDUCATION. (1-3)
See EDUC 498 for description. (Staff)
EDAD 499 (189). WORKSHOPS, CLINICS AND INSTITUTES. (1-6)
See EDUC 499 for description. (Staff)
EDAD 602 (202). THE JUNIOR COLLEGE. (3) (Staff)
EDAD 603 (203). PROBLEMS IN HIGHER EDUCATION (3) (Staff)
EDAD 605 (—). ADMINISTRATION FOUNDATIONS. (3) (Staff)
EDAD 606 (—). ADMINISTRATION BEHAVIOR AND ORGANIZATION MANAGEMENT. (3) (Staff)
EDAD 607 (—). ADMINISTRATIVE PROCESSES. (3) (Staff)
EDAD 608 (—). ADMINISTRATIVE RELATIONSHIPS. (3) (Staff)
EDAD 611 (211). THE ORGANIZATION AND ADMINISTRATION OF SECONDARY SCHOOLS. (3) (Staff)
EDAD 612 (212). SCHOOL FINANCE AND BUSINESS ADMINISTRATION. (3) (Staff)
EDAD 614 (214). SCHOOL PLANT PLANNING. (2-3) (Staff)
EDAD 616 (216). PUBLIC SCHOOL SUPERVISION. (3) (Staff)
EDAD 617 (217). ADMINISTRATION AND SUPERVISION IN ELEMENTARY SCHOOLS. (3) (Staff)
EDAD 625 (225). SCHOOL PUBLIC RELATIONS. (3) (van Zwoll)
EDAD 634 (234). THE SCHOOL CURRICULUM. (2-3) (Berman)
EDAD 635 (235). PRINCIPLES OF CURRICULUM DEVELOPMENT. (3) (V. Anderson, Berman, Bennett)
EDAD 679 (249). SEMINAR IN EDUCATIONAL ADMINISTRATION AND SUPERVISION. (2-4) (Staff)
EDAD 718 (218). SCHOOL SURVEYS. (2-6) (Staff)
EDAD 721 (221). ADVANCED SCHOOL PLANT PLANNING. (2) (van Zwoll)
EDAD 723 (223). PRACTICUM IN PERSONNEL RELATIONSHIPS. (2-6) (Newell)
EDAD 726 (226). CHILD ACCOUNTING. (2) (van Zwoll)
EDAD 727 (227). PUBLIC SCHOOL PERSONNEL ADMINISTRATION. (3) (van Zwoll)
EDAD 798 (288). SPECIAL PROBLEMS IN EDUCATION. (1-6) (Staff)
EDAD 799 (399). THESIS RESEARCH. (Master's Level) (Staff)
EDAD 802 (EDUC 302). CURRICULUM IN HIGHER EDUCATION. (3) (Kelsey)
EDAD 803 (EDUC 303). ORGANIZATION AND ADMINISTRATION IN HIGHER EDUCATION. (3) (Dudley, Wiggin)
EDAD 805 (EDUC 305). COLLEGE TEACHING. (3) (Kelsey)
EDAD 806 (EDUC 309). SEMINAR IN PROBLEMS OF HIGHER EDUCATION. (2) (Kelsey, Wiggin)
EDAD 837 (237). CURRICULUM THEORY AND RESEARCH. (2) (Bennett)
EDAD 888 (224). APPRENTICESHIP IN EDUCATION. (1-9)
EDAD 889 (287). INTERNSHIP IN EDUCATION. (3-16) (Staff)
EDAD 899 (499). DISSERTATION RESEARCH. (Doctorate Level) (Staff)

COUNSELING AND PERSONNEL SERVICES

Programs of preparation are offered by the Department of Counseling and Personnel Services at the master's degree, advanced graduate specialist, and doctoral degree levels for counselors in elementary and secondary schools, rehabilitation agencies, community agencies, college and university counseling centers. It also offers programs of preparation for other personnel services: college student personnel administration, visiting teacher and psychological services in schools.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

EDCP 410 (161). INTRODUCTION TO COUNSELING AND PERSONNEL SERVICES. (3)
Presents principles and procedures, and examines the functions of counselors, psychologists in schools, school social workers, and other personnel service workers. (Staff)

EDCP 411 (172). MENTAL HYGIENE. (3)
The practical application of the principles of mental hygiene to classroom problems. (Staff)

EDCP 460 (165). INTRODUCTION TO REHABILITATION COUNSELING. (3)
Introductory course for majors in rehabilitation counseling, social work, psychology, or education who desire to work professionally with physically or emotionally handicapped persons. (Staff)

EDCP 470 (200). INTRODUCTION TO STUDENT PERSONNEL. (3)

EDCP 489 (187). FIELD EXPERIENCE IN COUNSELING AND PERSONNEL SERVICES. (1-4)
See EDUC 489 for description. (Staff)

EDCP 498 (188). SPECIAL PROBLEMS IN COUNSELING AND PERSONNEL SERVICES. (1-3)
See EDUC 498 for description. (Staff)

EDCP 499 (189). WORKSHOPS, CLINICS, INSTITUTES. (1-6)
See EDUC 499 for description. (Staff)

FOR GRADUATE STUDENTS

See *Graduate School catalog* for descriptions.

EDCP 611 (243). OCCUPATIONAL CHOICE THEORY AND INFORMATION. (3) (Staff)

EDCP 614 (249). PERSONALITY THEORIES IN COUNSELING AND PERSONNEL SERVICES. (3) (Staff)

EDCP 615 (250). CASES IN APPRAISAL. (3) (Staff)

EDCP 616 (260). COUNSELING: THEORETICAL FOUNDATIONS AND PRACTICE. (3) (Staff)

EDCP 619 (261). PRACTICUM IN COUNSELING. (2-6) (Staff)

EDCP 645 (265). COUNSELING IN ELEMENTARY SCHOOLS. (3) (Staff)

EDCP 655 (254). ORGANIZATION AND ADMINISTRATION OF PERSONNEL SERVICES. (2) (Staff)

EDCP 656 (271). COUNSELING AND PERSONNEL SERVICES SEMINAR. (2) (Staff)

EDCP 661 (240). PSYCHO-SOCIAL ASPECTS OF DISABILITY. (3) (Staff)

EDCP 662, 663 (244, 245). MEDICAL ASPECTS OF DISABILITY. (3, 3) (Staff)

EDCP 735 (273). SEMINAR IN REHABILITATION COUNSELING. (2) (Staff)

EDCP 771 (241). THE COLLEGE STUDENT. (3) (Staff)

EDCP 776, 777 (263, 264). MODIFICATION OF HUMAN BEHAVIOR: LABORATORY AND PRACTICUM. (3, 3) (Staff)

EDCP 778 (272). SEMINAR IN STUDENT PERSONNEL. (2-6) (Staff)

EDCP 798 (288). SPECIAL PROBLEMS IN COUNSELING AND PERSONNEL SERVICES. (1-6) (Staff)

EDCP 799 (399). THESIS RESEARCH. (Master's Level) (Staff)

EDCP 888 (224). APPRENTICESHIP IN COUNSELING AND PERSONNEL SERVICES. (1-9) (Staff)

EDCP 889 (287). INTERNSHIP IN COUNSELING AND PERSONNEL SERVICES. (3-16) (Staff)

EDCP 899 (499). DISSERTATION RESEARCH. (Doctorate Level) (Staff)

SPECIAL SERVICES

The college provides several kinds of special services for faculty, students, schools, and teachers in the field:

BUREAU OF EDUCATIONAL RESEARCH AND FIELD SERVICES

The Bureau of Educational Research and Field Services has been established to (1) encourage and stimulate basic research bearing on different aspects of the educative process; (2) provide assistance in designing, implementing and evaluaitng research projects initiated by local school systems; (3) coordinate school systems' requests for consultants with the rich and varied professional competencies that are available on the University faculty. Additional information about the Bureau's services may be obtained from the Director, Bureau of Educational Research and Field Services.

CURRICULUM LABORATORY

The Curriculum Laboratory provides students, faculty and teachers in the field with materials and assistance in the area of curriculum. An up-to-date collection of curriculum materials is maintained. This includes texts, courses of study, study guides, curriculum studies and bibliographies. The laboratory is equipped to assist students and student teachers with preparation of teaching plans.

EDUCATIONAL TECHNOLOGY CENTER

The center is designed as a service facility for faculty and students that provides teaching aids of all kinds, audio-visual equipment and service, instruction in all aspects of instructional materials, aids, and new media. This 12-room complex contains model, flexible-in-size classrooms for optimal use of instructional media, an independent learning laboratory with 40 student stations, production and distribution rooms for a closed-circuit television and video tape system, laboratories for graphic and photographic production, and space for faculty research and development in the use of instructional media. Supporting the professional faculty in the operation of the center are such media specialists as a graphic artist and a television technician.

While the Educational Technology Center will function as a demonstration facility for on and off-campus groups requiring model media facilities, it is also designed to serve an instructional program offering graduate degrees in educational technology.

MUSIC EDUCATORS NATIONAL CONFERENCE HISTORICAL CENTER

The University of Maryland and the Music Educators National Conference established the MENC Histroical Center in 1965 for the purpose of building and maintaining a research collection which would reflect the development and current practices in music education. Located in McKeldin Library, the center includes study space and is prepared to assist scholars in the field. Materials in the following categories are collected: archival documents of the MENC; instructional materials; professional publications; curricular, administrative, and philosophical materials; manuscripts, personal letters and other historical materials. Further information about the collection and uses of

materials may be obtained by addressing the center's curator.

OFFICE OF LABORATORY EXPERIENCES

The Office of Laboratory Experiences is designed to arrange off-campus placement in laboratory experiences for students preparing to teach. In this capacity, it serves as a liaison between the University and the public schools. Applications for field placements, EDUC 300 students and student teachers are processed through this office. This office is also responsible for the Teacher Education Centers.

UNIVERSITY NURSERY-KINDERGARTEN LABORATORY SCHOOL

Housed in the College of Education, the Nursery-Kindergarten Laboratory School services the total University in the following ways: (1) acts as a center in which individual professors or students may conduct research; (2) serves as a unit for undergraduate students to have selected experiences with young children, such as student teaching, child study, and other forms of participation in a program for young children; (3) provides a setting in which educators from within and without the University can come for sources of ideas relative to the education of young children. Further information about the school's facilities or services can be obtained by contacting the director.

READING CENTER

The Reading Center provides clinical diagnostic and corrective services to a limited number of children. These services are a part of the program in correction and remedial reading offered to teachers on the graduate level.

SCIENCE TEACHING CENTER

The Science Teaching Center has been designed to serve as a representive facility of its tylpe to fulfill its functions of undergraduate and graduate science teacher education, science supervisor training, basic research in science education, aid to inservice teachers and supervisors, and consultative services, on all levels, kindergarten through community college. Its reference library features relevant periodicals, science and mathematics textbooks, new curriculum materials, and works on science subjects and their operational aspects. Its fully equipped research laboratory, in addition to its teaching laboratories for science methods courses, provides project space for both faculty and students.

Since 1962 the Science Teaching Center has served as the headquarters for the activities of the Science Teaching Materials Review Committee of the National Science Teachers Association. The Information Clearinghouse on Science and Mathematics Curricular Developments, started here that year also, is now the International Clearinghouse for A.A.A.S., N.S.F. and UNESCO. Within the center, then, is gathered the "software" and "hardware" of science education in what is considered to be one of the most comprehensive collections of such materials in the world.

OFF-CAMPUS COURSES

Through the University College, a number of courses in education are offered in Baltimore, in other centers in Maryland and overseas. These courses are chosen to meet the needs of groups of students in various centers. In these centers, on a part-time basis, a student may complete a part of the work required for an undergraduate or a graduate degree. Announcements of such courses may be obtained by addressing requests to the Dean, University College, College Park, Maryland.

STUDENT AND PROFESSIONAL ORGANIZATIONS

The college sponsors a chapter of the Student National Education Association, which is open to undergraduate students on the College Park campus. A student chapter of the Council for Exceptional Children is open to undergraduate and graduate students interested in working with exceptional children. A student chapter of the Music Educators National Conference (MENC) is sponsored by the Department of Music, and the Industrial Education Department has a chapter of the American Society of Tool and Manufacturing Engineers and a chapter of the American Industrial Arts Association.

In several departments there are informal organizations of students. All policy-recommending committees of the college include student representation.

UNIVERSITY CREDENTIALS SERVICE

All seniors graduating in the College of Education (except Education for Industry majors) are required to file credentials with the Placement Office in Cumberland Hall basement. Credentials consist of the permanent record of a student's academic preparation and recommendations from academic and professional sources. An initial registration fee enables the Placement Office to send a student's credentials to interested educational employers, as indicated by the student.

Students who are completing teacher certification requirements, who are completing advanced degrees and are interested in a teaching, administrative or research position in education, or who are completing advanced degrees in library science may also file credentials.

Other services include vacancy listing in secondary schools and institutions of higher learning, notifications of interest-related position, on-campus interviews with state and out-of-state school systems, and descriptive information on school systems throughout the country.

This service is also available to alumni. For further information contact Mrs. Anna Tackett, Assistant Director of Placement, the placement office, Cumberland Hall basement; or phone 454-2813.

GRADUATE STUDIES

For graduate study in education, requirements for admission vary with degree or diploma and special area for which the applicant is applying. Both the College of Education and The Graduate School must be satisfied as to the ability of the student to do graduate work.

Graduate students in education are required to take a test battery either after admission to the Graduate School, or before if results are needed as admission information.

Application for Admission

A graduate student in education must matriculate in the Graduate School. Application for admission is made in accordance with deadlines of the Graduate School for the semesters and summer terms.

Master's Degrees

A graduate student in education may matriculate for a Master of Education or a Master of Arts degree. For requirements of these degrees, the student should consult Graduate School announcements and material issued by the College of Education and the department.

Advanced Graduate Specialist in Education

A student who wishes to enter this program must have completed a master's degree or its equivalent and be otherwise acceptable. The student is admitted to the Graduate School on a special non-degree basis. For requirements of this program, the student should consult the bulletin issued by the College of Education.

Doctoral Degrees

Programs leading to a Doctor of Philosophy in education or Doctor of Education degrees are administered for the Graduate School by Education. For requirements of these degrees, the student should consult both the Graduate School announcements and the statement of policy relative to doctoral programs in education.

COLLEGE OF EDUCATION

ADMINISTRATIVE OFFICERS

CARBONE, Robert F., Dean of the College and Professor of Education, Department of Administration, Supervision and Curriculum
B.S., Eastern Montana College, 1953; M.Ed., Emory University, 1958; Ph.D., University of Chicago, 1961.

FUNARO, George J., Associate Dean and Associate Professor, Department of Secondary Education
B.S., American International College, 1956; M.A., Ph.D., University of Connecticut, 1965.

WIGGIN, Gladys A., Director of Graduate Studies and Professor of Education
B.S., University of Minnesota, 1929; M.A., 1939; Ph.D., University of Maryland, 1947.

FACULTY

ADKINS, Arthur J., Associate Professor of Education, Department of Secondary Education
B.S., State Teachers College, St. Cloud, Minnesota, 1942; M.A.,University of Minnesota, 1947; Ph.D., 1958.

AGRE, Gene P., Associate Professor of Education, Foundations of Education
B.A., Macalester College, 1951; B.S., University of Minnesota, 1953; M.A., 1956; Ph.D., University of Illinois, 1964.

ALLAN, Thomas K., Associate Professor, Counseling and Personnel Services, and Director, O.I.R.
B.S., Northwestern University, 1950; M.A., University of Maryland, 1964; Ph.D., University of Maryland, 1966.

AMERSHEK, Kathleen G., Associate Professor of Education, Department of Early Childhood-Elementary Education
B.S., Indiana, Pa. State Teachers College, 1951; M.Ed., Pennsylvania State University, 1957; Ph.D., University of Minnesota, 1966.

ANDERSON, Charles Ray, Assistant Professor of Education, Department ol Secondary Education
B.S., University of Maryland, 1957; M.Ed., University of Maryland, 1959.

ANDERSON, Evelyn J., Assistant Professor of Education, Library Science Education and Department of Early Childhood-Elementary Education
A.B., Bethany College, 1935; M.A., University of Chicago, 1957.

ANDERSON, J. Paul, Professor of Education, Dept. of Administration, Supervisor and Curirculum
B.S., University of Minnesota, 1942; M.A., 1947; Ph.D., 1960.

ANDERSON, Lowell D., Assistant Professor of Industrial Education, Department of Industrial Education
A.A., Ely Junior College, 1958; B.S., St. Cloud State College; Michigan State University, 1969.

ANDERSON, Vernon E., Professor of Education, Department of Administration, Supervision, and Curriculum
B.S., University of Minnesota, 1930; M.A., 1936; University of Colorado, 1942.

ANSELLO, Edward F., Assistant Professor of Education, Institute for Child Study
A.B., Boston College, 1966; M.Ed., University of Missouri, 1967; Ph.D., University of Missouri, 1970.

ASHLOCK, Robert B., Associate Professor of Education, Department of Early Childhood-Elementary Education
B.S., Butler University, 1957; M.S., 1959; Ed.D., Indiana University, 1965.

BAILY, Donald, Instructor in Industrial Education, Department of Industrial Education
A.A., South County Junior College, California, 1962; B.A., 1964; M.A., San Francisco State College, 1965.

BARTHOLOMEW, Rolland B., Assistant Professor in Education and Laboratory Director, Science Teaching Center, (part-time), Department of Secondary Education and Earth Science Curriculum Project
B.A., University of Colorado, 1948; M.A., University of Colorado, 1950; M.Ed., University of New Mexico, 1960.

BATES, Marina, Instructor, Department of Measurement and Statistics

BEATTY, Charles Joseph, Assistant Professor of Industrial Education, Department of Industrial Education
A.A., St. Lawrence College, 1955; B.S., Northern Michigan University, 1959; M.A., Michigan State University, 1963; Ph.D., Ohio State University, 1966.

BECKMAN, Carl J., Instructor in Education, Educational Technology Center
B.S., Indiana University of Pennsylvania, 1965; M.Ed., University of Maryland, 1969.

BENNETT, Roger V., Assistant Professor of Education, Department of Administration, Supervision and Curriculum
B.S., University of Wisconsin, Milwaukee, 1956; M.S., 1960; Ph.D., 1969.

BENNETT, Stanley W., Assistant Professor of Education, Institute for Child Study
B.S., Iowa State University, 1959; M.A., University of Iowa, 1961; Ph.D., University of Michigan, 1970.

BERMAN, Louise M., Professor of Education, Department of Administration, Supervision, and Curriculum, and Director, University Nursery Kindergarten Laboratory School
A.B., Wheaton College, Illinois, 1950; M.A., 1953; Ed.D., Teachers College, Columbia University, 1960.

BIALEK, Christine A., Lecturer in Education, Department of Secondary Education
B.A., Alliance College, 1963; M.A., University of Michigan, 1966; Ph.D., expected, University of Michigan, 1971.

BIELSKI, Peter, Coordinator of Student Teaching (part-time), Meadowbrook-Buckingham-Foxhill Elementary Teacher Education Center, Prince George's County
B.S., State University of New York, 1956; M.S., State University of New York, 1964.

BIRK, Janice M., Assistant Professor, Counseling and Personnel Services, and Counselor, Counseling Center
B.A., Sacred Heart College, 1963; M.A., Loyola University, 1966; Ph.D., University of Missouri, 1970.

BLUM, Beulah, Associate Professor of Music and Music Education, Departments of Secondary Education and Music
B.A., Queens College, 1949; M.A., Columbia University, 1954; Ed.D., University of Michigan, 1969.

BOEK, Jean K., Lecturer in Education, (P.T.), Interprofessional Research Commission on Pupil Personnel Services (IRCOPPS)
B.S., Cornell University, 1946; M.A., Michigan State University, 1947; Ph.D., Michigan State University, 1953.

BOLEA, Angelo Samuel, Associate Professor of Education, Institute for Child Study
B.A., Central Bible Institute, 1959; B.A., Evangel College, Missouri, 1961; Ed.M., Wayne State University, 1963; Ph.D., University of Nebraska, 1967.

BOSTIC, Benjamin R., Instructor, Counseling and Personnel Services, and Project Director, Upward Bound
B.S., D.C. Teachers College, 1961; M.Ed., The American University, 1969.

BOWIE, B. Lucile, Professor of Education, Institute for Child Study
B.S., University of Maryland, 1942; M.A., Teachers College, Columbia University, 1946; Ed.D., University of Maryland, 1957.

BRABBLE, Elizabeth W., Assistant Professor of Home Economics and Education, Department of Secondary Education
B.S., Virginia State College, 1960; M.S., Pennsylvania State University, 1966; Ph.D., 1969.

BRADLEY, David John, Instructor in Education, Department of Industrial Education
B.S., Colorado State University, 1966; M.Ed., Colorado State University, 1968.

BRIGGS, Chari, Assistant Professor of Special Education
B.A., William Smith College, 1960; M.A.T., Johns Hopkins 1961, Ph.D., University of Minnesota, 1966.

BRIGHAM, Bruce W., Associate Professor of Education, Departments of Early Childhood-Elementary Education and Secondary Education
B.S., 1954 and M.A., 1959, State University of New York at Brockport; Ph.D., Temple University, 1967.

BRITTINGHAM, Linda, Coordinator of Student Teaching (P.T.), Lewisdale-Adelphi Elementary Teacher Education Center, Prince George's County
B.S., University of Delaware, 1964; M.E., University of Maryland, 1968.

BROOME, Eleanor A., Instructor in Education, Institute for Child Study and Department of Early Childhood-Elementary Education and University Nursery-Kindergarten Laboratory School
B.A., University of Maryland, 1943; M.Ed., 1957.

BROWNE, Joseph Lewis, Instructor in Education (P.T.), Faculty Development Program, Department of Secondary Education
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QUILICI, Augustine F., Instructor in Foreign Language and Education, Department of Secondary Education
B.S., Appalachian State University, North Carolina, 1963; M.A., 1965.

RATHS, James D., Professor of Education and Director, Bureau of Educational Research and Field Services (BERFS)
B.S., Yale University, 1954; M.A., 1955; Ph.D., New York University, 1960.

RAY, Philip B., Associate Professor of Education, Department of Counseling and Personnel Services, and Counselor in Counseling Center
B.A., Antioch College, 1950; M.S., University of Pennsylvania, 1955; Ph.D., University of Minnesota, 1962.

REMSBERG, Instructor in Education, University Nursery-Kindergarten and Institute for Child Study
B.S. and M.Ed., University of Maryland, 1969, 1970.

RHOADS, David J., Associate Professor of Education, Department of Counseling and Personnel Services
B.A., Temple, 1954; M.A., 1958; Ed.D., University of Maryland, 1963.

RISINGER, Robert G., Professor of Education and Chairman, Department of Secondary Education
B.S., Ball State Teachers College, 1940; M.A., University of Chicago, 1947; Ed.D., University of Colorado, 1955.

RODERICK, Ellen M., Instructor in Education, Department of Administration, Supervision, and Curriculum, and Office of Laboratory Experiences, and Coordinator, Institute for Child Study Field Experiences
B.S., M.A., University of Maryland, 1966, 1968.

RODERICK, Jessie A., Associate Professor of Education, Department of Early Childhood-Elementary Education
B.S., Wilkes College, 1956; M.A., Columbia University, 1957; Ed.D., Temple University, 1967.

ROGERS, Bruce G., Assistant Professor of Education, Department of Measurement and Statistics
B.S., Arizona State University, 1961; M.A., Arizona State University, 1962; Ph.D., Michigan State University, 1968.

ROGOLSKY, Saul, Associate Professor of Education, Institute for Child Study
B.A., Harvard College, 1948; M.A., University of Chicago, 1953; Ed.D., Harvard Graduate School of Education, 1963.

ROSENTHAL, Barbara G., Instructor in Education, Department of Secondary Education and Department of Speech
B.A., University of Maryland, 1964.

RYSCAVAGE, Jerome J., Instructor in Education, Department of Administration, Supervision and Curriculum, and Administrative Assistant to the Dean (P. T.)
B.S., Central Connecticut State College, 1959; M.A., Ohio State University, 1961.

SCHAFER, William D., Assistant Professor of Education, Department of Measurement and Statistics
B.A., University of Rochester, 1964; M.A., 1965; Ed.D., 1969.

SEDLACEK, William E., Assistant Professor of Education, Department of Measurement and Statistics, and Assistant Director for Testing and Research in the Counseling Center
B.S., 1960; M.S., 1961 from Iowa State University; Ph.D., Kansas State University, 1966.

SEIDMAN, Eric, Associate Professor of Education, Department of Special Education
B.S., New York University, 1947; M.A., 1948; Ph.D., University of Connecticut, 1964.

SHANNON, John R., Instructor in Education (P. T.), Faculty Development Program, Department of Secondary Education
B.S., LaSalle College, Philadelphia, 1953; M.A., LaSalle College, 1954; M.A., Villanova, 1955; M.Ed., Catholic University, 1956.

SHELLEY, Shirley J., Assistant Professor of Music Education and Music, Departments of Early Childhood-Elementary Education and Music
B.Mus., University of Michigan, 1944; M.Mus., 1947.

SHERIDAN, Vivian A., Lecturer, Institute for Child Study
B.A., Calvin College, 1951; M.A., Michigan State University, 1954; Ed.D., University of Maryland, 1970.

SHORE, Milton F., Lecturer, Counseling and Personnel Services
B.A., Harvard College, 1949; M.A., Boston University, 1950; Ph.D., Boston University, 1955.

SIMMS, Betty Howald, Associate Professor of Education, Dept. of Special Education
B.A., Harris Teachers College, 1947; M.A., University of Michigan, 1955; Ed.D., University of Maryland, 1962.

SMITH, Carl W., Instructor in Education Department of Administration, Supervision and Curriculum and Administrative Assistant to the Dean
B.Ed., Rhode Island College, 1962; M.A., University of Maryland, 1967; Ed.D., in progress.

SMITH, Donald F., Instructor in Industrial Education, Department of Industrial Education (part-time), Faculty Development Program
B.S., Wilmington College, 1960; M.Ed., Kent State University, 1964.

SMITH, Harper J., Instructor in Industrial Education (P. T.), Department of Industrial Education
B.S., University of Oklahoma, 1950.

SMITH, Mark M., Training Coordinator for Production Management Training Program for Sheltered Workshops, Department of Industrial Education
B.S., Northland College, 1965; M.S., University of Wisconsin, 1969.

SMITH, William D., Coordinator, Teacher Education Center, Department of Administration, Supervision, and Curriculum, Office of Laboratory Experiences, and Howard County Public Schools
B.A., University of Southern Mississippi, 1953; M.A., Ed.D., University of New Mexico, 1958, 1970.

SPIELBICHLER, Otto, Assistant Professor of Education, Secondary School Counseling, and Office of Laboratory Experiences
B.S., Slippery Rock State College, 1959; M.A., Colgate University, 1962; Ph.D., Ohio State University, 1968.

STERN, Herbert J., Associate Professor of Education, Secondary School Counseling
B.S., Johns Hopkins University, 1950; M.Ed., Johns Hopkins, 1953; Ed.D., University of Maryland, 1962.

STOCKDALE, Jane A., Instructor in Education, Faculty Development Program
B.S., Indiana University of Pennsylvania, 1960; M.Ed., Indiana University of Pennsylvania, 1966.

STOUGH, Kenneth F., Assistant Professor in Education, Department of Industrial Education
B.S., Millersville State College, 1954; M.Ed., Pennsylvania State University, 1961; Ed.D., University of Maryland, 1968.

STROUD, Ronald R., Assistant Research Director of Regional Rehabilitation Institute, Department of Industrial Education
B.S., University of Maryland, 1967.

STUNKARD, Clayton L., Associate Professor of Education, Department of Measurement and Statistics, and Chairman of Education Research
B.A., University of Minnesota, 1948; M.A., 1951; Ph.D., 1959.

SULLIVAN, Dorothy D., Associate Professor of Education, Department of Early Childhood-Elementary Education
A.B., University of Maryland, 1945; M.Ed., 1960; Ed.D., 1965.

TACKETT, Anna A., Assistant Director of Placement and Credentials Service
B.A., University of Maryland, 1943.

TAYLOR, Corwin, Associate Professor of Music and Music Education, Departments of Secondary Education and Music
B.M., College of Music of Cincinnati, 1930; B.S., University of Cincinnati, 1932; M.M., College of Music of Cincinnati, 1933; M.Ed., University of Cincinnati, 1935; Ed.D., University of Cincinnati, 1941.

TETRAULT, Sylvia, Instructor, Counseling and Personnel Services
B.S., Concordia College, 1961; M.Ed., University of North Dakota, 1967.

THOMPSON, Fred R., Professor of Education, Institute for Child Study
B.A., University of Texas, 1929; M.A., 1935; Ed.D., University of Maryland, 1952.

TIERNEY, William P., Associate Professor of Industrial Education, Department of Industrial Education
B.S., Teachers College of Connecticut, 1941; M.A., Ohio State University, 1949; Ed.D., University of Maryland, 1952.

TYLER, Bonnie B., Lecturer, Institute for Child Study
B.A., DePauw University, 1948; M.A., Ph.D., Ohio State University, 1949, 1954.

van ZWOLL, James A., Professor of School Administration, Department of Administration, Supervision and Curriculum
B.A., Calvin College, Grand Rapids, Michigan, 1933; M.A., University of Michigan, 1937; Ph.D., 1942.

VOGT, Dorothee, Instructor in Education, Department of Measurement and Statistics

VOLCHKO, Carroll C., College Records Evaluator, Records Office, College of Education
B.A., University of Maryland, 1954.

WAETJEN, Walter B., Professor of Education and Vice President for Administrative Affairs
B.S., State Teachers College, Millersville, Pennsylvania, 1942; M.S., University of Pennsylvania, 1947; Ed.D., University of Pennsylvania, 1947; Ed.D., University of Maryland, 1951.

WALBESSER, Henry H., Jr., Associate Professor of Education and Mathematics (P. T.), and Director of University of Maryland Mathematics Project (UMMaP), Department of Secondary Education, and Associate Director of the Bureau of Educational Research and Field Services (BERFS)
B.S., State University of New York, 1958; M.A., University of Maryland, 1960; Ph.D., 1965.

WALKER, Virgil R., Lecturer, Department of Measurement and Statistics
B.S., University of Minnesota, 1927; M.A., University of Minnesota, 1932; Ph.D., University of Minnesota, 1957.

WARREN, Barbara, Coordinator of Student Teaching (P. T.), Forest Knolls-Kemp Mill Elementary Teacher Education Center, Montgomery County
B.S., Wilson Teachers College, 1941; M.A., American University, 1962.

WEAVER, V. Phillips, Associate Professor of Education and Chairman, Department of Early Childhood-Elementary Education
A.B., College of William and Mary, 1951; M.Ed., Pennsylvania State University, 1956; Ed.D., 1962.

WEDBERG, Desmond P., Associate Professor of Education, and Director of the Educational Technology Center
A.B., University of Southern California, 1947; A.M., 1948; Ed.D., 1963.

WHITE, Edward H., Instructor in Industrial Education
B.Ed., Keene State College, 1964; M.S., Indiana State University, 1966.

WHITE, Francis M., Instructor in Industrial Education (P. T.), Department of Industrial Education
B.S., University of Maryland, 1966.

WIGGIN, Gladys A., Professor of Education and Director of Graduate Studies
B.S., University of Minnesota, 1929; M.A., 1939; Ph.D., University of Maryland, 1947.

WILLARD, Wesley, Lecturer in Industrial Education (P. T.), Department of Industrial Education
B.B.A., University of Wisconsin, 1947; M.A., University of Maryland, 1967.

WILLIAMS, David L., Associate Professor of Education, Department of Early Childhood-Elementary Education
B.S., Bradley University, 1952; M.Ed., University of Illinois, 1956; Ed.D., 1964.

WILLIAMS, Michael J., Instructor in Education, (P. T.), Faculty Development Program, Department of Industrial Education
B.S., Rhode Island College, 1965; M.S., Central Connecticut State College, 1967.

WILLIAMS, Virginia, Coordinator of Student Teaching (P. T.), Parkdale-Nicholas Orem Secondary Teacher Education Center, Prince George's County
B.A., Blackburn College, 1954; M.S., Indiana University, 1956.

WILSON, Robert M., Professor of Education, Department of Early Childhood-Elementary Education, and Director of the Reading Center
B.S., California State Teachers College, Pennsylvania, 1950; M.S., University of Pittsburgh, 1956; Ed.D., 1960.

WIRTH, James H., Assistant Professor in Education, Departments of Early Childhood-Elementary Education and Secondary Education
B.S., Towson State College, 1953; M.Ed., University of Maryland, 1963; Ed.D., University of Maryland, 1969.

WOLVIN, Andrew D., Assistant Professor of Education and Speech, Department of Secondary Education
B.S., University of Nebraska, 1962; M.A., University of Nebraska, 1963.

WOODS, Albert W., Associate Professor of Education and Physical Education, Department of Secondary Education
B.S., University of Maryland, 1933; M.Ed., 1949.

WOOLF, Leonard, Associate Professor of Education, Department of Secondary Education
B.S., Johns Hopkins University, 1942; M.Ed., and Ed.D., University of Maryland, 1959.

WRENN, Jerry P., Assistant Professor of Education, Department of Secondary Education
B.S., East Carolina College, 1961; M.S., University of Tennessee, 1963; Ph.D., University of Maryland, 1970.

YAWKEY, Thomas, Assistant Professor of Education, Department of Early Childhood-Elementary Education
B.S., Indiana University of Pennsylvania, 1963; M.Ed., Duquesne University, 1966; Ph.D., University of Illinois, 1970.

YOUNG, David B., Assistant Professor of Education, Department of Secondary Education, and Assistant Coordinator of Laboratory Experiences
B.S., 1958, M.A., 1962 from Ohio State University; Ed.D., Stanford University, 1967.

YUSPA, Eleanor H., Instructor in Art and Education, Department of Secondary Education
B.A., Towson State College, 1965; M.Ed., University of Maryland, 1969.

ZACHARY, Lillian B., Associate Professor of Education, Department of Early Childhood-Elementary Education
A.B., University of North Carolina, 1943; M.A., Florida State University, 1955; Ed.D., 1960.

COOPERATING FACULTY FROM OTHER COLLEGES

DeVERMOND, Mary F., Associate Professor of Music

FANOS, Stavroilla, Instructor in Music

GALLAGHER, Charles, Assistant Professor of Music

GOOD, Richard, Director, Division of Institutional Research

LEVITINE, George, Head, Department of Art

LONGEST, James W., Associate Professor of Agricultural and Extension Education

MADDEN, Dorothy, Chairman of Dance Department

MUELLER, Marion, Instructor in Music

NELSON, Clifford, Associate Professor of Agricultural and Extension Education

PATRICK, Arthur J., Professor of Business Education and Information Systems

RYDEN, Einar R., Professor of Agricultural and Extension Education

SMITH, Clodus R., Associate Professor of Agricultural and Extension Education

STARCHER, E. Thomas, Assistant Professor of Speech

ULRICH, Homer, Chairman of the Department of Music

WACHHAUS, Gustav, Instructor in Music

WILSON, Bruce, Lecturer in Music, Curator, MENC historical Center

Engineering

THE COLLEGE OF ENGINEERING offers four-year programs leading either to the degree of Bachelor of Science with curriculum designation in aerospace engineering, agricultural engineering, chemical engineering, civil engineering, electrical engineering, mechanical engineering, or fire protection, or to the degree of Bachelor of Science in Engineering. In addition, each of the foregoing degree programs may be pursued through the five-year Maryland Plan for Cooperative Engineering Education. The engineering programs integrate these elements: (1) basic sciences including mathematics, physics, chemistry; (2) engineering sciences including mechanics of solids and fluids, engineering materials, thermodynamics, electricity, and magnetism; (3) professional studies in major fields of engineering specialization; (4) liberal arts and social studies in the General Education Program; and (5) certain other required subjects including health and physical activities.

GENERAL INFORMATION

Increasingly, the boundary between engineers and applied scientists or applied mathematicians becomes less distinct. The various branches of engineering similarly interact with each other, as technical problems become more sophisticated, and required a combined attack from several disciplines. The engineer occupies an intermediate position between science and the public, because, in addition to understanding the scientific principles of a situation, he is concerned with the timing, economics and values that define the useful application of those principles.

Each program lays a broad base for c*ontinued learning* after college in professional practice, in business or industry, in public service, or in graduate study and research.

COLLEGE REGULATIONS

1. The responsibility for proper registration and for satisfying stated prerequisites for any course must rest with the student—as does the responsibility for proper achievement in courses in which he is enrolled Each student should be familiar with the provisions of this catalog, including the *Academic Regulations,* contained in Appendix—and other pertinent regulations.
2. A student who is enrolled for more than eight semester-hours of work must register for physical education each semester until he has fully satisfied the University's requirement. He should schedule the required two credits of health during his first 30 credits of registration at the University.
3. Required courses in mathematics, physics and chemistry have highest priority; and every engineering student must register for mathematics and chemistry—or mathematics and physics—until he has fully satisfied requirements of the College of Engineering in these

subjects. Courses in mathematics, chemistry and physics may not be dropped.

4. A student is advised to schedule a reduced load if his record of scholarship during the previous semester was unsatisfactory (a) because he failed courses, or (b) because his average during the previous semester was less than 2.0 ("C"). A student who is on probation may not schedule more than 16 semester hours of work in any semester, *including* credit for physical education. However, he may not defer the top-priority subjects noted in Paragraphs 2 and 3 above without written approval of the dean.
5. A student in the College of Engineering has attained junior standing when he has completed a minimum of 56 academic hours toward his degree, including 15 credits of mathematics and 11 credits of physics and possessing the minimum required grade point average to remain in the University.
6. As indicated in *Academic Regulations*, a student who has not attained junior standing may not register for upper division courses.
7. To be eligible for a bachelor's degree in the College of Engineering, a student must have an *average* of at least "C"—2.0—(a) in all subjects applicable to his degree, and (b) in all junior-senior courses in his major department. Responsibility for knowing and meeting all degree requirements for graduation in any curriculum rests with the student.
8. A student in the College of Engineering may audit a course only with the understanding that the course may not be taken for credit subsequent to his registration as audit. He must also have the consent of the department offering the course. Forms requesting permission to audit courses are available in the Engineering Student Affairs Office, J 183.

STRUCTURE OF ENGINEERING CURRICULA

Courses in the normal curriculum or program and prescribed credit hours leading to the degree Bachelor of Science (with curriculum designation) are outlined on the following pages for each department in the College of Engineering. No student may modify the prescribed number of hours without special permission from the dean of his college. The courses in each curriculum may be classified in the following categories:

1. Certain courses required of all undergraduate students in the University. Students who are not specifically exempted are required to register in and successfully complete two prescribed courses in physical education for a total of two semester hours of credit. A health course (2 credits) is also required of all undergraduate men and women.
2. Courses in the General Education Program. These include: English (nine credits), fine arts or philosophy (three credits), history (six credits), and social science (six credits). A listing of specific courses which meet the requirements of the General Education Program are listed elsewhere in this catalog.
3. Courses in the physical sciences—mathematics, chemistry, physics.
4. Collateral engineering courses—engineering sciences, and other courses approved for one curriculum but offered by another department.
5. Courses in the major department.

A student should obtain written approval for any substitution of courses from the department chairman and the dean of his college.

The courses in each engineering curriculum, as classified above, form a sequential and development pattern in subject matter. In this respect, curricula in engineering may differ from curricula in other colleges. Some regulations which are generally applicable to all students (see the *Academic Regulations)* may need clarification for purposes of orderly administration among engineering students. Moreover, the College of Engineering establishes policies which supplement the University regulations.

BASIC FORMAT OF THE FRESHMAN-SOPHOMORE YEARS IN ENGINEERING

The freshman and sophomore years in engineering are designed to lay a strong foundation in mathematics, physical sciences and the engineering sciences upon which the student will later develop his professional program during the upper division (junior and senior) years. The College course requirements for the freshman year are the same for all students, regardless of their intended professional career, and about 75% of the sophomore year course requirements are common, thus affording the student a maximum flexibility in choosing his specific area of engineering specialization. Although the engineering students selects his major field at the start of his sophomore year, this intramural program commonality affords the student the maximum flexibility of choice or interdepartmental transfer up to the end of his sophomore year.

GENERAL COLLEGE REQUIREMENTS FOR THE FRESHMAN AND SOPHOMORE YEARS

	Credit Hrs.
A. Health and Physical Education	
Health (HLTH 105)	2
Physical Education (two, one semester courses are required, these carry no academic credit)	2
B General Education	12
C Mathematics	16
Four courses in mathematics are required to be selected from MATH 140, 141, 240, 241, and 246. If MATH 246 is the last course in the sequence, only 15 credit hours (total) in Math will result and one (1) credit hour is added to the Engineering Sciences or Math and Physical Sciences Electives.	
D Physical Sciences	19
A minimum of 19 credit hours in Physics and Chemistry must be completed, with not less than seven (7) in either field.	

E. Engineering Sciences ... 9
Nine (9) credit hours must be completed in the Engineering Sciences, to be selected from ENES 101, or ENES 110, ENES 220 and ENES 221. Each is a three (3) credit hour course.

F. Engineering Sciences, Mathematics, Physical Sciences or Major Field Engineering ... 8
Eight (8) credit hours to complete the freshman-sophomore year requirements may be in any of the fields indicated, but no more than six (6) credit hours may have a major field designation.

Total Minimum Academic Credits in Freshman-Sophomore ... 66
(Plus 2 semesters of physical education)

BASIC AND ALTERNATE CURRICULA FOR FRESHMEN IN ENGINEERING

All freshmen in the College of Engineering are required to complete the following basic curriculum for freshmen regardless of whether the student plans to proceed through one of the major field designated baccalaureate degree programs or follow any of the multidisciplinary, non-designated degree programs that are sponsored by the College.

BASIC FRESHMAN CURRICULUM IN ENGINEERING

	Semester I	Semester II
Course No. and Title		
HLTH 105—Science and Theory of Heath	2	..
CHEM 103, 104—General Chemistry**	4	4
PHYS 161—General Physics I	..	3
MATH 140, 141—Analysis I, II	4	4
ENES 101—Intro, Engr. Science	3	..
ENES 110—Mechanics	..	3
General Education Courses	3	3
Physical Activities	1	1
Total Credits	17	18

Students who are not prepared to schedule MATH 140 are advised to schedule MATH 115 (3 cr.) and ENGL 101 (3 cr.) in the Summer Session before the fall (first) Semester. MATH 115 does not count toward fulfilling the requirements of an engineering degree . . . . . it is a preparatory course. Otherwise, students will schedule their freshman years as showing in the following:

ALTERNATE FRESHMAN CURRICULUM IN ENGINEERING

Course No. and Title	Semester I	Semester II	Summer
HLTH 105—Science and Theory of Health	2		
CHEM 103, 104—General Chemistry**	4	4	
PHYS 161—General Physics I			3
MATH 115—Intro. to Analysis***	3		
MATH 140, 141—Analysis I, II		4	4
ENES 101—Intro. Engr. Science	3		
ENES 110—Mechanics		3	
General Education Courses	3	6	
Physical Activities	1	1	
Total Credits	16	18	7

THE SOPHOMORE YEAR IN ENGINEERING

With the beginning of his sophomore year the student selects his sponsoring academic department (Aerospace, Agricultural, Chemical, Civil, Electrical, Fire Protection, or Mechanical Engineering), and this department assumes the responsibility for the student's academic guidance, counseling and program planning from that point until the completion of the degree requirements of that department as well as the College.

** Qualified students may elect to take CHEM 105 and 219 (3 cr. hrs. each) instead of CHEM 103 and 104.

*** MATH 115 is an additional course for those students who do not qualify to begin with MATH 140.

SOPHOMORE CURRICULUM IN ENGINEERING

	Semester I	Semester II
General Education	3	3
Math 240— Linear Algebra	4	..
Math 241 or 246—Analysis III or Differential Equations	..	3 or 4[1]
Phys 262, 263—General Physics	4	4
ENES 220—Mechanics of Materials	3[2]	..
ENES 221—Dynamics	..	3[3]
Major field or related courses	2 or 4	2 or 5[4]
Total Credits	16 or 18	15 or 19

BACHELOR OF SCIENCE DEGREE IN ENGINEERING

The undesignated degree program (B.S.-Engr.) is designed to serve three primary functions: (1) to prepare those students who wish to use the breadth and depth of the engineering education as a preparatory vehicle for entry into post-baccalaureate study in such fields as medicine, law and/or business administration; (2) to develop a background for those who wish to continue their engineering training in the graduate area of some of the newer interdisciplinary fields of engineering such as environmental engineering, bio-medical engineering, systems engineering, and many others; and finally (3) to assist those students who do not plan the normal professional practice of a designated engineering field upon graduation, but wish to use a broader engineering training to serve in auxiliary and supporting, aspects of engineering related industries. The program is designed to give the maximum flexibility for tailoring a program to the specific future career plans of the student.

The program in no sense represents a dilution of the rigor of the normal engineering educational program, but rather it builds a flexible program based upon the same course offerings and topical

[1]Chemical engineering students should register for Math 246—all others register for Math 241. Aerospace engineering students should register for both courses.

[2]May be taken either first or second semester. Electrical engineering students take ENES 240 and ENES 243 in place of ENES 220.

[3]May be taken either first or second semester. Chemical engineering students take CHEM 201, CHEM 203, and CHEM 204 in place of ENES 221 and one general education course is delayed until senior year.

[4]The major field or related courses recommended in the sophomore year are as follows: Aerospace: CMSC 110—Elementary Algorithmic Methods (3) and ENAE 281—Elements of Aerospace Engineering (4), and ENAE 282—Elements of Air Transportation (1)

Agricultural: ENES 230—Materials Science (3) or ENCE 200—Fundamentals of Engineering Materials (3); BOTN 100—General Botany (4) or ZOOL 101—General Zoology (3), and AGRI 101—Introduction to Agriculture (1).

Chemical: ENCH 215—Chemical Engineering Analysis I (2) and ENCH 250—Chemical Engineering Analysis II (3).

Civil: ENCE 230—Introduction to Environment Engineering (3) and ENCE 280—Engineering Survey Measurements (3).

Electrical: ENEE 206—Circuit Analysis I (4) and ENEE 207—Circuits Laboratory I (1).

Fire Protection: ENFP 280—Fire Protection Organization (3) and ENFP 290—Essentials of Fire Protection (3).

Mechanical: ENME 200—Introduction to Mechanical Engineering (2) and ENME 216—Thermodynamics I (3).

coverage used in the designated degree programs . . . . . the only difference is that the student following the undesignated degree path will sacrifice some of the depth or breadth of the designated degree program to include coverage in a secondary engineering field (engineering minor) that might be of more significant value to his future career plans.

It should be emphasized that the program is *not* a general engineering or an engineering science program. It is a blending of two, or possibly three (by suitable selection of engineering electives), fields of engineering to afford the student a multidisciplinary engineering background. In the B.S. Engineering program, the student is under the professional guidance and counseling direction of his major field department and they will plan his entire baccalaureate career. The student will graduate with a concentration in a specific field (Ch.E., E.E., etc.) and thus will have a professional base for his continuing growth and development.

The proposed program should be particularly attractive to those students contemplating graduate study in the interdisciplinary graduate engineering fields, such as environmental engineering, bio-engineering, bio-medical engineering, and systems and control engineering, or for preparatory entry into graduate work, in materials engineering, or nuclear engineering which are currently not offered as designated baccalaureate fields at Maryland. For example, a student contemplating graduate work in environmental engineering might combine chemical and civil engineering for his total program, a student interested in systems and control engineering graduate work might combine electrical engineering with either chemical, mechanical, or aerospace engineering. Since the specific course requirements are flexible, there is increased opportunity for those students contemplating a career through law, medical, or business administration routes to begin preparation in this direction yet still complete a sound undergraduate engineering preparation.

TABLE I shows the *minimum* requirements for a B.S. degree in Engineering; the 66 semester credit hours required for the completion of the junior and senior years is superimposed upon the freshman and sophomore curriculum completed by the student. The student need not make a decision whether to take the designated or the undesignated degree in an engineering field until the beginning of his junior year. In fact, he can probably delay the decision until the spring term of his junior year with little or no sacrifice, thus affording the student ample time for decision.

TABLE I
JUNIOR-SENIOR REQUIREMENTS
for a
B.S. DEGREE IN ENGINEERING (undesignated)
(B.S.-Engr.)

	Minimum Credit Hour Requirements to Fulfill the Jr.-Sr. Year Requirements
GENERAL EDUCATION	12 credit hours
MATHEMATICS, PHYSICAL AND ENGINEERING SCIENCES (18 credit hours)*	
Math or Physical Science, required	3 credit hours
Engineering Sciences,** required	8 credit hours
Math, Physical or Engineering Science,** electives:	9 credit hours
ENGINEERING FIELDS of CONCENTRATION (36 credit hours)***	
Primary Engr. Field	24 credit hours
Secondary Engr. Field	12 credit hours
TOTAL JR.-SR. CREDIT HOUR REQUIREMENTS (Minimum)	66

TABLE II
POSSIBLE PRIMARY AND SECONDARY ENGINEERING FIELDS OF CONCENTRATION FOR THE B.S.-ENGINEERING DEGREE

TABLE II lists the currently available primary and secondary fields of concentration that are possible under the format of TABLE I according to the presently available course offerings within the College.

Primary Engr. Field	24 credit hours
Secondary Engr. Field	12 credit hours

Primary Fields	Secondary Fields
Aerospace Engineering	Aerospace Engineering
Agricultural Engineering	Agricultural Engineering
Chemical Engineering	Chemical Engineering
Civil Engineering	Civil Engineering
Electrical Engineering	Electrical Engineering
Engineering Materials	Engineering Materials
Fire Protection	Fire Protection
Mechanical Engineering	Mechanical Engineering
Nuclear Engineering	Nuclear Engineering

GENERAL ENGINEERING COLLEGE REQUIREMENTS FOR THE B.S.-ENGINEERING DEGREE

All undergraduate students in engineering will select their major field sponsoring department (i.e.: Aero., Chemical, Civil, Electrical, Fire Protection, or Mechanical Engineering) at the beginning of their second year regardless of whether they plan to proceed to a designated or an undesignated degree. A student wishing to elect to undesignated degree program may do so at any time following the completion of his sophomore year, or a minimum of 50 earned credits towards any engineering degree, and at least one semester prior to the time he expects to receive the baccalaureate degree in engineering. His curriculum planning, guidance and counseling will be the responsibility of the "Undesignated Degree Program Advisor" in his primary field department. At least one semester before the expected degree is to be

* Of the 18 required credits in the Mathematics, Physical and Engineering Sciences, nine must be at the 100 course level and above.

** For the purposes of the B.S.—Engineering degree, an Engineering Science course, with the singular exception noted below, are those courses in the Engineering College prefixed by ENES designation or are in an engineering field not his primary or secondary field of concentration. The singular exception to the above is that the student may use up to six credits of course work numbered below 100 in his primary or secondary engineering field of concentration as engineering sciences.

*** All of the courses used to fulfill the primary and secondary engineering field requirement of 36 semester credit hours must be at the 100 course level and above.

granted the student must file an "Application for Admission to Candidacy for the Degree of Bachelor of Science in Engineering" with the Dean's Office of the College of Engineering. The candidacy form must be approved by the chairman of the primary field department, the primary engineering and secondary engineering field advisors and the college faculty committee on "undesignated Degree Programs." This committee has the responsibility for implementing all approved policies pertaining to this program and reviewing and acting on the candidacy forms filed by the student.

Specific University and College academic regulations apply to this undesignated degree program in the same manner as they apply to the conventional designated degree programs. For example, the academic regulations of the University apply and the College requirement of 2.00 factor in his major field during the junior and senior years apply. For the purpose of implementation of such academic rules, the 24 credits in the primary engineering field and the 12 credits in the secondary engineering field are considered to count as a "36 credit major" for such academic purposes.

ENVIRONMENTAL ENGINEERING

Environmental engineering is the application of basic engineering and science to the problems of our environment to ensure optimum environmental quality. In recent years, man has suffered a continually degrading environment. A truly professional engineer involved in the study of environmental engineering must see the total picture and relate it to his particular mission whether this be air pollution, water quality control, environmental health or solid and liquid waste disposal. The total picture includes urban systems design, socio-economic factors, regional planning, transportation, recreation, water resource development, and land and resource conservation.

A student who selects the B.S.-Engineering degree program can specialize in environmental engineering by proper selection of primary and secondary fields from the wide selection of courses related to environmental engineering given by the various departments in the college. For complete information the student should consult the bulletin *Environmental Engineering* available at departmental offices and the Dean's Office.

ENGINEERING-MEDICINE

Engineering has become an integral part of the medical profession. Heart pumps, synthetic kidneys, heart-lung machines, and artificial organs are a few of the advancements in medical technology developed by teams of engineers and physicians. Diagnostic procedures have been greatly enhanced by the use of computers and electronic testing machines. The physician who has an engineering background is in a better position to communicate and work with engineers on medical technological development.

The Bachelor of Science in Engineering degree provides an excellent opportunity for a student to meet the entrance requirements for medical school while earning an engineering degree. The student should select chemical engineering as his major field of concentration. For more information the student may simply address a postcard to Engineering-Medicine Information, College of Engineering, University of Maryland, College Park, Md. 20742, or he may inquire at the Student Affairs Office, Room J-183.

The above examples of environmental engineering and engineering-medicine are only two applications of the Bachelor of Science in Engineering degree programs. Many other examples could be listed. Students interested in a flexible program in engineering should give consideration to this program.

CO-OPERATIVE ENGINEERING EDUCATION PROGRAM

The *Maryland Plan* for co-operative engineering education at the University of Maryland, offered by the College of Engineering, presents a five-year program leading to a Bachelor of Science degree. The academic requirements for students following the co-op plan of education are identical to the academic requirements for those students following the regular four-year program. In addition to the normal academic requirements, the co-op student has scheduled periods of professional internship which must be satisfactorily completed to qualify for the baccalureate degree under the co-op plan.

The co-op plan begins after the student has completed the freshman and sophomore requirements of his major field. This co-op plan involves only the last half of the student's baccalaureate program, the junior and senior years. The alternating plan of study and professional internship lengthens this normal two-year period to three years. Delaying entry into the co-op plan until the junior year offers considerable educational advantages to the student. The student retains the normal freshman-sophomore program years to afford time for the selection of his major field of engineering . . . or even whether he wishes to continue in engineering . . . without committing himself to either the regular four-year or the co-op plan of education. A more mature and meaningful series of professional internship assignments are possible, to benefit both the student and his professional partner. Also, the plan is readily adaptable to the needs of the student transferring to the University from the pre-engineering programs of the community colleges or following the completion of the first two years of engineering at other colleges and universities.

The Maryland Plan for Co-operative Engineering Education is shown in the tabulation on the following page. Briefly, the co-op student spends three semesters and two summers in resident

study and three semesters and one summer in professional internship to complete his baccalaureate degree requirements; all students complete the program with student-residence at the University. The study-residence periods are the normal semester or eight weeks summer sessions at the University; the internship periods are of 20 weeks duration during the fall or spring semesters and 10 weeks during the summer.

As shown in the tabulation, the basic plan (Group I and II) has students beginning their co-op program with the fall semester following the completion of the freshman and sophomore requirements and graduating within three years after beginning the program. The Group III plan is a modification of the Group II basic plan, for a limited number of students who wish to accelerate their co-op program. Similarly, Group IV is a delayed entry program for those students who did not complete their freshman-sophomore requirements in time for normal entry into the program; it is anticipated that this Group IV plan will be attractive to those transfer students having basic academic deficiencies to make up.

Students are selected for the co-op plan from applications filed with the Co-operative Education Office of the College of Engineering. While the student applies during his sophomore year, he must have completed the sophomore year requirements before formal entry into the program. A student must have a minimum 2.00 grade point average to qualify for the program. While the selection of applicants is based primarily on scholarship, dependability, ability to work well with others, and financial need. Students are placed in professional intern situations which will provide the best possible professional experiences consistent with career objectives. Extensive planning and coordination of college-industry-student liaison is necessary to insure the realization of the program objectives.

CO-OPERATIVE PLAN OF EDUCATION, COLLEGE OF ENGINEERING, UNIVERSITY OF MARYLAND

NOTE The student must have completed all the Freshman and Sophomore requirements of his major field before entry into the co-op plan.

	THE BASIC PLAN		BASIC PLAN MODIFICATIONS	
	GROUP I	GROUP II	GROUP III*	GROUP IV**
SUMMER			Study	
FALL	Study	Intern (1,2)	Intern (1,2)	
SPRING	Intern (1,2)	Study	Study	Intern (1,2)
SUMMER	Study	Intern (3)	Intern (3)	Study
FALL	Intern (3,4)	Study	Study	Intern (3,4)
SPRING	Study	Intern (4,5)	Intern (4,5)	Study
SUMMER	Intern (5)	Study	Study	Intern (5)
FALL	Study	Intern (6,7)	Intern (6,7)	Study
SPRING	Intern (6,7)	Study	Study	Intern (6,7)
SUMMER	Study	Study		Study
FALL				Study

*Group III is a limited enrollment group for students wishing to accelerate their program. The freshman-sophomore years work must have been completed prior to enrollment in the Pre-Co-op summer session.

**Group IV is a delayed entry limited enrollment group for students who did not complete their freshman-sophomore year requirements in time for a normal fall semester entry into the co-op plan.

Students make their own arrangements for board and lodging while on their periods of internship. Frequently the participating industrial company or governmental agency will assist the student in locating good, inexpensive lodging. The internship wages are paid directly to the student by his employer.

During the semesters or summer sessions in which the student attends school, he pays the regular tuition and fees assessed by the University. A $30.00 fee is charged for each 10-week period of professional internship. There is one 10-week period when a student interns during the summer and three double periods (20 weeks each) when he interns during the fall or spring semesters. The professional intern fee is payable at the beginning of each intern period and is not refundable. The co-op plan student usually completes seven 10-week periods of professional internship to complete all requirements for the Bachelor of Science degree under the co-op plan of th College of Engineering.

AEROSPACE ENGINEERING

Professors: Corning, Pai,* Rivello, and Sherwood.
Associate Professors: Melnik.
Assistant Professors: Barlow, Donaldson, Filotas, Jones, Plotkin, Schaeffer, Shankar, and Weissharr.
Instructor: Greenwood.
Lecturers: Anderson, Billig, Brandt, Fleig, and Wilson.

An aerospace engineer applies a knowledge of mathematics and the physical sciences to the problems of flight through the Earth's atmosphere and outer space, and more generally, to the problems of all modern transportation and exploration. His special areas of study are the behavior of fluids and structures, separately or in combination. While many aerospace engineers are concerned with advancing research such as exploring the flow of blood through the human body, the majority of aerospace engineers are concerned with (1) flight through the Earth's atmosphere, (2) the strength and stiffness of lightweight structures, or (3) the means of propelling flight vehicles.

The undergraduate curriculum includes basic courses in all areas of aerospace engineering; aerodynamics, structures, structural dynamics. propulsion, flight mechanics, and design. Aerodynamics involves the application of the laws of fluid flows to determine the lift, drag and other aerodynamic characteristics of the vehicle or solid. in flight at supersonic speeds the aerodynamicist must include the effects of shock waves, while at reentry speeds the influence of chemical reactions in the atmospheric gas must be considered. The topic of structures is mainly concerned with the ability of the vehicle to withstand the forces created by motion through the vehicle environ-

ment. The effects of structural flexibility must be considered and, for flight at high speeds, the heating of the structure can substantially influence its behavior. Structural weight is always of great concern. Propulsion includes studies of reciprocating engine-propeller combinations, gas turbines and rockets with primary emphasis on the determination of the thrust and the fuel consumption rate. An appreciation for the properties of materials at elevated temperatures is essential for both propulsion and structural considerations. Flight mechanics deals with the ability of a vehicle to be flown along certain flight paths. The maneuverability of an aircraft and the handling qualities of a lunar module are both of concern in flight mechanics. Design encompasses all of the facets of aerospace engineering; the aerodynamic, structural and propulsion systems integrate to yield a vehicle with certain flight characteristics and with a capability to perform specific tasks.

The aerospace engineer may be involved in space exploration or research, general aviation, military weaponry, commercial air transportation, or many other related activities. His expertise allows him to make substantial contributions to the advancement of mankind.

AEROSPACE ENGINEERING CURRICULUM

	Semester	
Junior Year	I	II
General Education Courses	..	3
ENAE 371—Aerodynamics I	4	..
ENAE 372—Aerodynamics II	..	4
ENES 220—Mechanics of Materials	3	..
ENAE 351—Flight Structures I	..	4
ENES 230—Materials Science	3	..
ENAE 440—Dynamics of Aerospace Vehicles	..	3
ENME 216—Thermodynamics	3	..
ENEE 300, 302—Principles of Electrical Engineering	3	3
ENEE 301, 303—Electrical Engr. Lab.	1	1
Total	17	18
Senior Year		
General Education Courses	3	6
ENAE 411—Aircraft Design	3	..
ENAE 461—Flight Propulsion	3	..
ENAE 352—Flight Structures II	4	..
ENAE 455—Aircraft Vibrations	..	3
ENAE 475—Viscous Flow & Aerodynamic Heating	3	..
Technical Electives	..	9
Total	16	18

With the approval of the Department of Aerospace Engineering students must elect 6-7 hours from among the following courses: ENAE 412, ENAE 457, ENAE 462, ENAE 473, and ENAE 488. Students must also select an additionaal three hours from the above list of five courses or must elect three hours of 300 or 400 level engineering or mathematics.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

ENAE 281 (190X). ELEMENTS OR AEROSPACE ENGINEERING. (4)
First semester. Prerequisite: ENES 110. Three lectures and one laboratory per week. Characteristics of the atmosphere, forces on vehicles in flight, fundamental consideration of aerodynamics, structure, and propulsion systems. Elementary aircraft and spacecraft performance.

ENAE 282 (190Y). ELEMENTS OF AIR TRANSPORTATION. (1)
Second semester. Prerequisite: ENAE 281. One laboratory per week. Characteristics of the U.S. airway system, navigation systems, air ttraffic control, F.A.A. regulations, economic factors affecting air transportation. Future developments and their relation to society.

ENAE 351 (113). FLIGHT STRUCTURES I. (4)

ENAE 352 (114). FLIGHT STRUCTURES II. (4)
First semester, three 50-minute lectures and one hour laboratory per week. Second semester, three lectures a week. Prerequisites: ENES 220, MATH 241 and MATH 246. Principles and problems of stress analysis and structural design of flight structures.

ENAE 371 (101). AERODYNAMICS I. (4)
First semester. Three lectures and one laboratory each week. Prerequisites: ENAE 281, PHYS 263 and MATH 246. Basic fluid mechanics and aerodynamics theory.

ENAE 372 (102). AERODYNAMICS II. (4)
Second semester. Three lectures and one laboratory each week. Prerequisites: ENAE 371 and ENME 216. Elements of compressible flow, and applications to engineering problems.

ENAE 411 (107). AIRCRAFT DESIGN. (3)
First semester. One lecture and two laboratory periods each week. Prerequisites: ENAE 351, ENAE 371, ENAE 372. Theory, background, and methods of airplane design, subsonic, supersonic and VTOL.

ENAE 412 (108). DESIGN OF AEROSPACE VEHICLES. (4)
Theory, background and methods of space vehicle design for manned orbiting vehicle, manned lunar and martian landing systems.

ENAE 440 (118). DYNAMICS OF AEROSPACE VEHICLES. (3)
Second semester. Three lectures each week. Prerequisite: ENAE 281 and ENAE 371. Stability, control and miscellaneous topics in dynamics.

ENAE 455 (117). AIRCRAFT VIBRATIONS. (3)
Second semester. Three lectures each week. Prerequisite: ENAE 351 and MATH 246. Vibration and other dynamic problems occurring in structures. Specific topics of study include the free and forced vibrations, single degree of freedom system, multiple degrees of freedom, beams and bars.

ENAE 457 (184). FLIGHT STRUCTURES III. (3)
Technical elective. Second semester. Three lectures each week Prerequisite: ENAE 352 or equivalent. An advanced undergraduate course dealing with the theory and analysis of the structures of flight vehicles. Topics will include, stresses due to sheer, indeterminate structures, matrix methods, plane theory, buckling and failure of plates.

ENAE 461 (109). FLIGHT PROPULSION. (3)

ENAE 462 (110). FLIGHT PROPULSION. (3)
Two lectures and one laboratory period a week. Operating principles of piston, turbojet, turboprop, ramjet, and rocket engines. Thermodynamic processes and engine performance, aero-thermochemistry of combustion, fuels and propellants, energy for space flight.

ENAE 470 (115). AERODYNAMICS III. (3)
Prerequisite: ENAE 371. Elementary theory of the flow of an incompressible fluid.

ENAE 473 (180). AERODYNAMICS OF HIGH SPEED FLIGHT. (3)
Technical elective. Second semester. Three lectures each week. Prerequisitte: ENAE 372 or equivalent. An advanced course dealing with aerodynamic problems of flight at supersonic and hypersonic velocities. Topics will include unified hypersonic supersonic small disturbance theory, real gas effects, aerodynamic heating and mass transfer with applications to hypersonic flight and re-entry.

ENAE 475 (190Z). VISCOUS FLOW AND AERODYNAMIC HEATING. (3)
First semester. Prerequisites: ENAE 371 and 372, ENME 216. Three lectures per week. Fundamental aspects of

viscous flow. Navier-stokes equations, similarity. boundary layer equations laminar, transitional and turbulent incompressible flows on airfoils, therma/boundary layers and convective heat transfer. Conduction through solids. Introduction to radiative heat transfer.

ENAE 481 (111). ELECTIVE RESEARCH. (3)
Technical elective. Second semester. Wind tunnel tests, structural tests. Written and oral reports on original research projects.

ENAE 488 (190). TOPICS IN AEROSPACE ENGINEERING. (1-4)
Technical elective taken with the permission of the student's advisor and instructor. Lecture and conference courses designed to extend the student's understanding of aerospace engineering. Current topics are emphasized.. In the Acadamic Year 1971-72 the following special topics courses are offered.
A. ADVANCED SUBJECTS IN FLUID MECHANICS
B. AEROSPACE ACOUSTICS

ENAE 651 (250). ADVANCED FLIGHT STRUCTURES. (3)
ENAE 652 (251). ADVANCED FLIGHT STRUCTURES. (3)
ENAE 655 (270). STRUCTURAL DYNAMICS AND AEROELASTICITY. (3)
ENAE 656 (271). STRUCTURAL DYNAMICS AND AEROLASTICITY. (3)
ENAE 661 (260). ADVANCED PROPULSION. (3)
ENAE 662 (261). ADVANCED PROPULSION. (3)
ENAE 671 (220). AERODYNAMICS OF INCOMPRESSIBLE FLUIDS. (3)
ENAE 672 (221). AERODYNAMICS OF INCOMPRESSIBLE FLUIDS. (3)
ENAE 673 (224). AERODYNAMICS OF COMPRESSIBLE FLUIDS. (3)
ENAE 674 (225). AERODYNAMICS OF COMPRESSIBLE FLUIDS. (3)
ENAE 675 (280). AERODYNAMICS OF VISCOUS FLUIDS. (3)
ENAE 676 (281). AERODYNAMICS OF VISCOUS FLUIDS. (3)
ENAE 681 (232). WAVE PROPAGATION IN GASES AND SOLIDS. (3)
ENAE 682 (233). WAVE PROPAGATION IN GASES AND SOLIDS. (3)
ENAE 683 (234). AEROSPACE FACILITIES AND TECHNIQUES. (3)
ENAE 684 (235). AEROSPACE FACILITIES AND TECHNIQUES. (3)
ENAE 688 (290). SEMINAR. (Var.)
ENAE 756 (274). ADVANCED STRUCTURAL DYNAMICS I. (3)
ENAE 757 (275). ADVANCED STRUCTURAL DYNAMICS II. (3)
ENAE 773 (230). AERODYNAMICS OF HIGH ALTITUDE VEHICLES. (3)
ENAE 774 (231). AERODYNAMICS OF HIGH ALTITUDE VEHICLES. (3)
ENAE 776 (236). HEAT TRANSFER PROBLEMS ASSOCIATED WITH HIGH VELOCITY FLIGHT.
ENAE 777. (237). HEAT TRANSFER PROBLEMS ASSOCIATED WITH HIGH VELOCITY FLIGHT.
ENAE 788 (291). SELECTED TOPICS IN AEROSPACE ENGINEERING
ENAE 789 (292). SELECTED TOPICS IN AEROSPACE ENGINEERING
ENAE 799 (399). THESIS RESEACH. (Master's Level) (Var)
ENAE 899 (499). DISSERTATION RESEARCH. (Doctoral Level) (Var.)

AGRICULTURAL ENGINEERING

Professors: Green, Harris and Winn.
Associate Professors: Cowan, Felton and Merrick.
Assistant Professors: Hummel, Merkel and Rebuck.
Instructors: Brodie, Rice, Seibel and Stewart.
Research Associates: Wheaton and Willson (visiting).

The Agricultural Engineering curriculum is open to students in Engineering or Agriculture. The Department is administered through the College of Agriculture.

Agricultural engineering utilizes both the physical and biological sciences to help meet the needs of our increasing world population for food, natural fiber and improvement or maintenance of the environment. Scientific and engineering principles are applied to the conservation and utilization of soil and water resources for food production and recreation; to the utilization of energy to improve labor efficiency and to reduce laborious and menial tasks; to the design of structures and equipment for housing or handling of plants and animals to optimize growth potential; to the design of residences to improve the standard of living for the rural population; to the development of methods and equipment to maintain or increase the quality of food and natural fiber; to the flow of supplies and equipment to the agricultural and aquacultural production units; and to the flow of products from the production units and the processing plants to the consumer. The agricultural engineer places emphasis on maintaining a high quality environment as he works toward developing efficient and economical engineering solutions.

The undergraduate curriculum provides opportunity to prepare for many interesting and challenging careers in design, management, research, education, sales, consulting, or international service. The program of study includes a broad base of mathematical, physical and engineering sciences combined with basic biological sciences. Twenty hours of electives give flexibility so that a student may plan a program according to his major interest.

	Semester	
Junior Year	I	II
ENME 216—Thermodynamics I	3	..
ENCE 330 or ENME 340—Fluid Mechanics	3	..
ENCE 350—Fundamentals of Structural Analysis	3	..
ENCE 351—Basic Structural Design	..	3
AGEN 324—Engr. Dynamics of Bio-Materials	..	3
AGEN 343—Functional Design of Machinery and Equipment	3	..
General Education Courses	3	3
Technical Elective*	..	5
Elective	..	3
ENEE 300—Principles of Electrical Engr.	3	..
Total	18	17
Senior Year		
AGEN 421—Power Systems	3	..
AGEN 424—Design of Ag. Structures	..	3
AGEN 422—Soil and Water Engr.	..	3
General Education Courses	3	3
General Education Course	3	.

Elective		3
Tech Electives*	6	3
Total	15	15

* Technical Electives
Fourteen credits, related to field of concentration, must be selected from a departmentally approved list. Eight credits must be 300 level and above.

AGEN 313 (113). MECHANICS OF FOOD PROCESSING. (4)
First semester. Three lectures and one laboratory. Prerequisite: PHYS 111, 121, or 161. Applications in the processing and preservation of foods of power transmission, hydraulics, electricity, thermodynamics, refrigeration, instruments and controls, materials handling and time and motion analysis. (Cowan)

AGEN 324 (121). ENGINEERING DYNAMICS OF BIOLOGICAL MATERIALS. (3)
Second semester. Three lectures per week. Prerequisite: ENME 340. Investigate the physical parameters (impact, temperature, humidity, light, etc.) governing the response of biological materials. Analyses of unit operations and their effect on the physical and quality characteristics of agricultural products. (Cowan)

AGEN 343 (143). FUNCTIONAL DESIGN OF MACHINERY & EQUIPMENT. (3)
First semester. Two lectures and one two hour laboratory per week. Prerequisite: ENES 221. Theory and methods of agricultural machine design. Application of machine design principles and physical properties of soils and agricultural products in design of machines to perform specific tasks. (Hummel)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

AGEN 421 (144). POWER SYSTEMS. (3)
First semester. Two lectures and one two hour laboratory per week. Prerequisites: ENME 216 and ENME 340. Analysis of energy conversion devices including internal combustion engines, electrical and hydraulic motors. Fundamentals of power transmission and coordination of power sources with methods of power transmission. (Harris)

AGEN 422 (145). SOIL AND WATER CONSERVATION ENGINEERING. (3)
Second semester. Two lectures per week. Prerequisite: ENME 340. Applications of engineering and soil sciences in erosion control, drainage, irrigation and watershed management. Principles of agricultural hydrology and design of water control and conveyance systems. (Rebuck)

AGEN 424 (142). FUNCTIONAL AND ENVIRONMENTAL DESIGN OF AGRICULTURAL STRUCTURES. (3)
Second semester. Two lectures and one two hour laboratory per week. Prerequisite: AGEN 324. An analytical approach to the design and planning of functional and environmental requirements of plants and animals in semi- or completely enclosed structures. (Merkel)

AGEN 432 (165). GENERAL HYDROLOGY. (3)
Second semester. Three lectures per week. Qualitative aspects of basic hydrologic principles pertaining to the properties, distribution and circulation of water as related to public interest in water resources. (Rebuck)

AGEN 433 (175). ENGINEERING HYDROLOGY. (3)
First semester. Three lectures per week. Prerequisites: MATH 246, ENCE 330, or ENME 340. Properties, distribution and circulation of water from the sea and in the atmosphere emphasizing movement overland, in channels and through the soil profile. Qualitative and quantitative factors are considered. (Rebuck)

AGEN 435 (185). AQUACULTURAL ENGINEERING. (3)
Second semester. Prerequisite: consent of Department. A study of the engineering aspects of development, utilization and conservation of aquatic systems. Emphasis will be on harvesting and processing aquatic animals or plants as related to other facets of water resources management. (Wheaton)

AGEN 489 (189). SPECIAL PROBLEMS IN AGRICULTURAL ENGINEERING. (1-3)
Prerequisite: approval of Department. Student will select an engineering problem and prepare a technical report. The problem may include design, experimentaton, and or data analysis. (Staff)

FOR GRADUATES

See *Graduate School Catalog* for descriptions.

AGEN 601 (201). INSTRUMENTATION SYSTEMS. (3)
AGEN 602 (203). MECHANICAL PROPERTIES OF BIOLOGICAL MATERIALS. (3)
AGEN 603 (202). BIOLOGICAL PROCESS ENGINEERING. (3)
AGEN 605 (204). LAND AND WATER RESOURCE DEVELOPMENT ENGINEERING. (3)
AGEN 698 (302). SEMINAR. (1)
AGEN 699 (301). SPECIAL PROBLEMS IN AGRICULTURAL AND AQUACULTURAL ENGINEERING. (Var.)
AGEN 799 (399). RESEARCH. (Var.)
AGEN 899 (499). RESEARCH.

CHEMICAL ENGINEERING

Professors: Arsenault, Beckmann, Duffey, Gomezplata, Johnson*, Marchello, Schroeder, Silverman*, Smith, and Skolnick**
Associate Professors: Bolsaitis**, Cadman, Munno*, Regan, Roush***, and Spain**
Assistant Professors: Almenas*, Blair*, Gentry, Kugelman, Sheaks*, and Spivak****
Part-Time Professors: Goldman*, Hoffman, and Kruger
Lecturers: Belcher* and Dedrick

Chemical engineering involves the application of sound engineering and economic principles—and basis sciences of mathematics, physics and chemistry—to process industries concerned with the chemical transformation of matter. The chemical engineer is primarily concerned with research and process development leading to new chemical process ventures or a better understanding of existing ones; with the efficient operation of the complete chemical plants or its component units; with the technical services engineering required for improving and understanding chemical plant operation and the products produced; with the chemical sales and economic distribution of the chemical plant product; and with the general management and executive direction of chemical process industry plants and industrial complexes.

Because of this wide range of ultimate application, the chemical engineer finds interesting and diverse career opportunities in such varied fields as chemical (inorganic and organic), food processing and manufacture, metallurgical, nuclear and energy conversion, petroleum (refining, production, or petrochemical), and pharmaceutical industries. Additional opportunities are presented by the research and development activities of many public and private research institutes and allied agencies.

* Member of Nuclear Engineering Faculty group.
** Member of Engineering Materials Faculty group.
*** Joint Appointment with Physics.
**** Joint Appointment with Textiles.

The Chemical Engineering Department offers a curriculum to prepare the undergraduate for a challenging career in any of the aforementioned fields of interest—a curriculum that will prepare him for continued graduate study or immediate industrial employment following the baccalaureate degree.

The program is developed around three areas: chemical, materials and nuclear engineering. In addition, the development of programs in applied polymer science, and biological and environmental health engineering has been initiated. These new programs are interdisciplinary with other departments of the University.

	Semester	
Junior Year	I	II
General Education Courses	6	3
ENCH 440—Chemical Engr. Kinetics	..	3
ENCH 442—Chemical Engineering Systems Analysis and Dynamics	..	2
ENCH 443—Dynamics and Control Lab.	..	1
CHEM 481, 482—Physical Chemistry	3	3
CHEM 431—Physical Chemistry Lab.	3	..
Technical Elective	..	2
ENCH 295—Chemical Process Thermo	3	..
ENCH 425, 427—Transfer and Transport Processes I, II	4	3
Total	16	17
Senior Year		
General Education Courses	..	3
ENEE Electives	3	..
ENCH 333—Seminar	..	1
ENCH 437—Chemical Engneering Lab.	3	..
ENCH 445—Process Engr. and Design	..	3
ENCH 447—Chem. Engineering Econ.	..	2
Technical Electives	4	7
Total	16	16

ENCH 215 (015). CHEMICAL ENGINEERING ANALYSIS I. (2)
Prerequisite: CHEM 104 or equivalent. Introduction to methods of chemical engineering analysis. Stoichiometric relations, use of computers, stagewise computations, and application of material and energy balances to chemical engineering operations and processes.

ENCH 250 (050). CHEMICAL ENGINEERING ANALYSIS II. (3)
Prerequisite: ENCH 215. Methods of chemical engineering analysis. Computational methods, optimization and control techniques, and other numerical tools applied to chemical processing systems. Analytical and computer methods are presented.

ENCH 295 (099). CHEMICAL PROCESS THERMODYNAMICS. (3)
Prerequisite: CHEM 104, principles of thermodynamics and their application to engineering problems. First and second laws of thermodynamics, properties of gases, liquids and solids, phase equilibrium, flow and non-flow systems, energy conversion, production of work from heat, thermodynamic analysis of processes, equilibrium stage operations and the thermodynamics of chemically reacting systems.

ENCH 333, 334 (133, 134). CHEMICAL ENGINEERING SEMINAR. (1, 1)
Prerequisite: senior standing. Oral and written reports on recent developments in chemical engineering and the process industries. Fall and spring semesters.

ENCH 425 (127). TRANSFER AND TRANSPORT PROCESSES I. (4)
Prerequisite: ENCH 250. Theory and applications of molecular and turbulent transport phenomena. Principles of fluid mechanics, mass transfer and heat transfer. Dimensional analysis, analogy between heat, mass and momentum transfer, Newtonian and non-Newtonian flow, convective heat and mass transfer.

ENCH 427 (129). TRANSFER AND TRANSPORT PROCESS II. (3)
Prerequisite: ENCH 425. Steady and unsteady state diffusion and conduction, simultaneous heat and mass transfer, interphase transfer, boundary layer theory. Application to absorption, adsorption, extraction and distillation. Principles of radiant heat transfer, evaporation, filtration, crystallization, drying, condensation, boiling humidification, ion exchange, and phase separations.

ENCH 437 (137). CHEMICAL ENGINEERING LABORATORY. (3)
First or second semester. Prerequisite: ENCH 427. Application of chemical engineering process and unit operation principles in small scale semi-commercial equipment. Data from experimental observations are used to evaluate performance and efficiency of operations. Emphasis is placed on correct presentation of results in report form.

ENCH 440 (145). CHEMICAL ENGINEERING KINETICS. (3)
Second semester. Prerequisite: ENCH 250. Fundamentals of chemical reaction kinetics and their application to the design and operation of chemical reactors. Reaction rate theory, homogeneous reactions in batch and flow systems, adsorption, heterogeneous reactions and catalysis, electrochemical reactions. Catalytic reactor design.

ENCH 442 (157). CHEMICAL ENGINEERING SYSTEMS ANALYSIS. (2)
Differential equations or ENCH 453. Dynamic response applied to process systems. Goals and modes of control, laplace transformations, analysis and synthesis of simple control systems, closed loop response, dynamic testing.

ENCH 443 (159). DYNAMICS AND CONTROL LABORATORY. (1)
Prerequisite: ENCH 442 concurrently. Methods of process control. Use of experimental analog and mathematical models of control systems.

ENCH 445 (147). PROCESS ENGINEERING AND DESIGN. (3)
First or second semester. Prerequisite: ENCH 427. Utilization of chemical engineering principles for the design of process equipment. Typical problems in the design of chemical plants. Comprehensive reports are required.

ENCH 447 (149). CHEMICAL ENGINEERING ECONOMICS. (2)
Second semester. Prerequisite: ENCH 427. Principles of engineering economics applied to chemical processes. Determination of investment and operating costs for chemical processes. Determination of investment and operating costs for chemical plants.

ENCH 450 (150). CHEMICAL PROCESS DEVELOPMENT. (3)
First semester. Prerequisite: ENCH 427. Chemical process industries from the standpoint of technology, raw materials, products and processing equipment. Operations of the major chemical processes and industries combined with quantitative analysis of process requirements and yields.

ENCH 452 (152). ADVANCED CHEMICAL ENGINEERING ANALYSIS. (3)
Second semester. Prerequisite: ENCH 425. Application of digital and analog computers to chemical engineering problems. Numerical methods, programming, differential equations, curve fitting, amplifiers and analog circuits.

ENCH 453 (116). APPLIED MATHEMATICS IN CHEMICAL ENGINEERING. (3)
Prerequisite: MATH 240. Mathematical techniques applied to the analysis and solution of chemical engineering problems. Use of differentiation, integration, differential equations, partial differential equations and integral transforms. Application of infinite series, numerical and statistical methods.

ENCH 454 (154). CHEMICAL PROCESS ANALYSIS. (3)
First semester. Prerequisites: ENCH 427, 440. Applica-

tions of mathematical models of chemical processes based on transport phenomena, chemical kinetics and other chemical engineering methods. Emphasis on principles and results of modelling.

ENCH 455 (155). CHEMICAL PROCESS LABORATORY. (2) First semester. Prerequisites: ENCH 427, and 440. Experimental study of various chemical processes through laboratory and small semi-commercial scale equipment. Reaction kinetics, fluid mechanics, heat and mass transfer.

ENCH 461 (161). CONTROL OF AIR POLLUTION SOURCES. (3) Prerequisite: senior standing in the engineering or consent of instructor. Theory and application of methods for the control and removal of airborne materials. Principles of design and performance of air quality control equipment.

ENCH 468 (165). RESEARCH. (2-3) First and second semesters. Prerequisite: permission of the staff. Investigation of a research project under the direction of one of the staff members. Comprehensive reports are required.

ENCH 480 (180). ENGINEERING ANALYSIS OF PHYSIOLOGICAL SYSTEMS. (3) Engineering description and analysis of physiological systems. Survey of bioengineering literature and an introduction to mathematical modeling of physiological systems.

ENCH 490 (190). INTRODUCTION TO POLYMER SCIENCE. (3) Prerequisite: consent of instructor. The elements of the chemistry, physics, processing methods, and engineering applications of polymers.

ENCH 492 (192). APPLIED PHYSICAL CHEMISTRY OF POLYMERS. (3) Prerequisite: CHEM 481. Corequisite: CHEM 482 or consent of instructor. Kinetics of formation of high polymers, determination of molecular weight and structure, and applied thermodynamics and phase equilibria of polymer solutions.

ENCH 494 (198). POLYMER TECHNOLOGY LABORATORY. (3) One lecture and two lab periods per week. Prerequisite: ENCH 492 or consent of instructor. Measurement of mechanical, electrical, optical, thermal properties of polymers. Measurement of molecular weight by viscosimetry, isometric and light scattering methods. Application of x-ray, NMR, ESR, spectroscopy, molecular relation, microscopy and electron microscopy to the determination of polymer structure. Effects of ultraviolet light and high energy radiation.

ENCH 609 (201). GRADUATE SEMINAR. (1)

ENCH 610 (203). CHEMICAL ENGINEERING THERMODYNAMICS. (3)

ENCH 620 (250). METHODS OF ENGINEERING ANALYSIS. (3)

ENCH 630 (205). TRANSPORT PHENOMENA. (3)

ENCH 640 (211). ADVANCED CHEMICAL REACTION KINETICS. (3)

ENCH 648 (247). SPECIAL PROBLEMS IN CHEMICAL ENGINEERING. (Var.)

ENCH 655, 656 (315, 316). RADIATION ENGINEERING. (3,3)

ENCH 667 (317). RADIATION EFFECTS LABORATORY. (3)

ENCH 670 (370). RHEOLOGY OF ENGINEERING MATERIALS. (3)

ENCH 690 (390). POLYMERIC ENGINEERING MATERIALS. (3)

ENCH 720 (207). PROCESS ANALYSIS AND SIMULATION. (3)

ENCH 723 (223). PROCESS ENGINEERING AND DESIGN. (3)

ENCH 730 (209). COMPLEX EQUILIBRIUM STAGE PROCESSES. (3)

ENCH 735 (235). CHEMICAL PROCESS DYNAMICS. (3)

ENCH 737 (237). CHEMICAL PROCESS OPTIMIZATION. (3)

ENCH 761 (261). ENGINEERING ANALYSIS OF CIRCULATORY SYSTEM TRANSPORT. (3)

ENCH 762 (262). BIOENGINEERING TRANSPORT PHENOMENA. (3)

ENCH 763 (263). ENGINEERING OF ARTIFICIAL ORGANS. (3)

ENCH 784 (284). POLYMER PHYSICS. (3)

ENCH 786 (286). POLYMER PROCESSING AND APPLICATIONS. (3)

ENCH 799 (399). THESIS RESEARCH. (Master's Level) (Var.)

ENCH 818 (253). ADVANCED TOPICS IN THERMODYNAMICS. (3)

ENCH 828 (255). ADVANCED TOPICS IN CHEMICAL REACTION SYSTEMS. (3)

ENCH 838 (257). ADVANCED TOPICS IN TRANSFER THEORY. (3)

ENCH 848 (259). ADVANCED TOPICS IN SEPARATION PROCESSES. (3)

ENCH 899 (499). DISSERTATION RESEARCH. (Doctoral Level) (Var.)

CIVIL ENGINEERING

Professors: Looney, Lepper, Otts, Ragan.

Associate Professors: Birkner, Carter, Cookson, Cournyn, Garber, Heins, Israel, Piper, Sternberg and Wedding.

Assistant Porefssors: Colville, Haefner, Hall, Harris, McCuen, Reilly, and Witzcak.

Lecturers: Rajan.

CIVIL ENGINEERING CURRICULUM

Civil engineering is concerned with the planning, design, construction and operation of large facilities associated with man's environment. Civil engineers specialize in such areas as environmental engineering, transportation systems, structures, water resource development, water supply and pollution control, urban and regional planning, construction management, and air pollution control. Many civil engineers enter private practice as a consulting engineer or start their own business in the construction industry. Others pursue careers with local, state, and federal agencies or with large corporations.

The undergraduate program is founded on the basic sciences and emphasizes the development of a high degree of technical competence. The program orients the student toward computer aided design techniques and prepares him to incorporate new concepts that will develop during his professional career. Further, the program stresses the balance between technical efficiency and the needs of society. The graduate is prepared to enter one of the areas mentioned above, or he can move into new areas specialization such as oceanographic engineering or the development of facilities for extra-terrestrial environments.

At no time has man been more concerned with the quality of his environment. Man is concerned with broad environmental problems such as pollution and the operation of his transportation systems. Man is also concerned with problems such as a need for new approaches in the design and construction of buildings. The civil engineering

profession faces the greatest challenge in its history as it assumes a central role in the solution of the physical problems facting the urban-regional complex.

Junior Year	Semester I	Semester II
General Education Course	..	3
ECON 205—Fundamentals of Economics	3	..
ENCE 360—Numerical Analysis and Computer Programming	..	3
ENCE 381—Applied Math. in Engr.	3	..
ENME 215—Principles of Mech. Engr.	..	3
ENCE 350—Fundamentals of Structural Analysis	3	..
ENCE 351—Basic Structural Design	..	3
ENCE 330—Basic Fluid Mechanics	3	..
ENCE 300—Fundamentals of Engineering Materials	3	..
ENCE 340—Basic Soil Mechanics	..	3
ENCE 370—Fundamentals of Transportation Engineering	3	..
Technical Elective (See Note B)	..	3
Total	18	18
Senior Year		
General Education Courses	3	3
ENCE 460—Computer Analysis	3	..
ENCE 420, 421—Basic Civil Engineering Planning	2	1
Technical Electives (See Note B)	6*	6*
Extra-Departmental Electives (See Note A)	3	3
ENEE 330—Fundamentals of Elec. Engr.	..	3
Total	17	16

* These numbers represent four three-semester-credit courses. Additionel semester credits will be involved to the extent thet courses carrying more than three credits ere selected.

NOTES CONCERNING ELECTIVES:

The student shall, with the assistance of his advisor, select a coherent program of electives in accordance with the following:

A. Six (6) elective credits (two courses) must be taken outside the Department of Civil Engineering. Three credits must be in a field related to economics management or business law. The other three are at the choice of the student.

B. Four technical elective courses (12-17 credits) must be taken as specified below:

(1) A two-course sequence must be taken from one of the following.
- (a) ENCE 410, 411, 412
- (b) ENCE 430, 431, 432
- (c) ENCE 433, 434, 435
- (d) ENCE 440, 441, 400
- (e) ENCE 450, 451
- (f) ENCE 461, 462
- (g) ENCE 470, 471

(2) Three courses may be selected from any 400 level electives offered by the Department With departmental approval, one of the three may be a suitable technical elective outside the Department.

FOR UNDERGRADUATE CREDIT

ENCE 221 (106) INTRODUCTION TO ENVIRONMENTAL ENGINEERING (3)
Three lectures per week An introduction to the basic principles for the development of water supplies, control of pollution and design and operation of water purification and waste water disposal facilities.

ENCE 280 (090). ENGINEERING SURVEY MEASUREMENTS. (3)
First and second semester. Two lectures and one labor- Two lectures and one laboratory per week. Prerequisite: MATH 141 or concurrent registration. Standards, units, calibration, measurement of distance, elevation, angles, systematic and random error analysis in measurements, fundamentals of mapping, instrumentation.

ENCE 300 (050). FUNDAMENTALS OF ENGINEERING MATERIALS. (3)
Two lectures and one laboratory per week. Prerequisite: ENES 220 or concurrent registration. Properties and constitution of the principal materials used in civil engineering. Laboratory tetsts for these properties, interpretation of test results and of specifications.

ENCE 330 (105). BASIC FLUID MECHANICS. (3)
Three lectures per week. Prerequisite: ENES 220, 221, PHYS 262. The study of fluids at rest and in motion. Principles of viscous turbulent flow. Impulse and momenttum concepts. Pumps, turbines and meters. Dimensional analysis and laws of similarity.

ENCE 340 (107). FUNDAMENTALS OF SOIL MECHANICS. (3)
Three lectures per week. Prerequisites: ENES 220 and ENCE 200. Introductory study of the mechanics of aggregations and its application to earthworks and foundations. Engineering geology relative to civil engineering and soil mechanics.

ENCE 350 (102). FUNDAMENTALS OF STRUCTURAL ANALYSIS. (3)
Three lectures per week. Prerequisites: ENES 220 and ENCE 200. Basic statics and mechanics of structural systems. Introduction to indeterminate analysis.

ENCE 351 (103). BASIC STRUCTURAL DESIGN. (3)
Three lectures per week. Prerequisite: ENCE 350. Basic elements of structural design of wood, steel and concrete without dependence on individual specifications. Classical design of beams, trusses, columns, connections and foundations.

ENCE 360 (100). ENGINEERING ANALYSIS AND COMPUTER PROGRAMMING. (3)
Three lectures per week. Prerequisite: ENCE 381 or concurrent registration. Elements of operational calculus, vector analysis, numerical methods and programming computers. Errors, interpolation, series, integration, iteration and solution of equations.

ENCE 370 (108). FUNDAMENTALS OF TRANSPORTATION ENGINEERING. (3)
Prerequisite: ENCE 200 and 280. Engineering problems of transportation by airways, highways, pipe-lines, railways and waterways. Elementary dynamics of traffic and functional consideration of routes and terminals.

ENCE 380 (195). ADVANCED SURVEYING. (3)
Two lectures and one laboratory per week. Prerequisite: ENCE 280. Advanced surveying theory and practice including triangulation, topographic surveying, astronomical observations, map systems, state plane coordinates, map interpretation, vertical and horizontal alignment. Computer applications.

ENCE 381 (112). APPLIED MATHEMATICS IN ENGINEERING. (3)
Three lectures per week. Prerequisite: MATH 241. Mathematical technique applied to the analysis and solution of engineering problems. Use of differentiation, integration, differential equations, and integral transforms. Application of infinite series, numerical and statistical methods.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

ENVIRONMENTAL AND WATER RESOURCES ENGINEERING

ENCE 430 (145). ADVANCED FLUID MECHANICS. (4)
Three lectures and one laboratory per week. Prerequisite: ENCE 330. The study of the properties and flow of an ideal fluid. Viscosity, laminar and turbulent flow, flow

nets, uniform flow, source, irrotational motion and circulation. Turbulence and boundary layers.

ENCE 431 (146). HYDROLOGIC ANALYSIS AND DESIGN. (3)
Prerequisites: ENCE 360, 330. Concurrent registration in ENCE 460 or permission of instructor. Study of the physical processes of the hydrologic cycle, hydrometerology, concepts of weather modification, evaporation and transpiration infiltration studies, run off computations, flood routing, reservoir requirements, emphasis on process simulation as a tool in water resource development.

ENCE 432 (147). GROUND WATER HYDROLOGY. (3)
Prerequisites: ENCE 330, ENCE 460 or permission of instructor. Concepts related to the development of the ground water resource, hydrogeology, hydrodynamics of flow through porous media, hydraulics of wells, artificial recharge, sea water intrusion, basin-wide ground water development.

ENCE 433 (176). ENVIRONMENTAL HEALTH ENGINEERING ANALYSIS. (3)
First semester. Two lectures and one laboratory per week. The theory and analytical techniques used in evaluating man's environment. Emphasis is given to the areas of quantitative, physical, electroanalytical and organic chemistry as applied to chemical analysis of water.

ENCE434 (177). AIR POLLUTION. (3)
Three lectures per week. Classification of atmospheric pollutants and their effects on visibility, inanimate and animate receptors. Evaluation of source emissions and principles of air pollution control; meteorological factors governing the distribution and removal of air pollutants; air quality measurements and air pollution control legislation.

ENCE 435 (175). SANITARY ENGINEERING ANALYSIS AND DESIGN. (4)
Second semester. Three lectures and one laboratory per week. Prerequisite: ENCE 231. The application of sanitary analysis and fundamental principles to the design and operation of water and waste water treatment plants and the control of stream pollution.

TRANSPORTATION AND URBAN SYSTEMS ENGINEERING

ENCE 420 (109). BASIC CIVIL ENGINEERING PLANNING I. (2)
Two lectures per week. Prerequisites: ENCE 331, 340, 351, and 370. Lectures in the methodology used in the application of the basic civil engineering courses to the general practice of civil engineering but with special emphasis on planning of extensive civil engineering works. In addition, preparation of engineering reports, specifications and projects presentation, economics, functional aspects.

ENCE 421 (110). BASIC CIVIL ENGINEERING PLANNING II. (1)
One laboratory of three hours per week. Prerequisite: ENCE 420. Laboratory for application of the program and principles developed in Basic Civil Engineering Planning I.

ENCE 461 (187). ANALYSIS OF CIVIL ENGINEERING SYSTEMS. (3)
Prerequisite: senior standing or consent of instructor. Application of the principles of engineering economy and statistics to the solution of civil engineering problems. Economic comparison of alternatives using present worth, annual cost, rate of return and cost benefit analysis. Development and use of simple and multiple regression models, and statistical decision theory.

ENCE 462 (188). ANALYSIS OF CIVIL ENGINEERING SYSTEMS II. (3)
Prerequisite. ENCE 461 or equivalent. Application of iconic, analytic, numeric, and probabilistic models to the solution of civil engineering problems. Existing inventory, allocation replacement, and competitive models are examined. Emphasis is on model construction and solution, and implementation of the obtained solutions.

ENCE 470 (185). HIGHWAY ENGINEERING. (3)
First semester. Three lectures per week. Prerequisite: ENCE 340. Location, design, construction and maintenance of roads and pavements. Introduction to traffic engineering.

ENCE 471 (186). TRANSPORTATION ENGINEERING. (3)
Second semester. Three lectures per week. Prerequisite: ENCE 370. A study of the principles of transportation engineering as applied to the various modes of transport. Consideration is given to cost analysis, economic aspects of route and site selection and layout. The organization and administration of engineering functions.

ENCE 472 (—). HIGHWAY AND AIRFIELD PAVEMENT DESIGN. (3)
Second semester. Prerequisites: ENCE 340, 370, and 470 or equivalent. Two lectures and one laboratory per week. Principles of pavement analysis and design. Analysis of moving loads and pavement response. Subgrade evaluation and beneficiation. Flexible and rigid pavement design; related materials specifications and tests.

STRUCTURAL ENGINEERING

ENCE 400 (155). ADVANCED MATERIALS OF ENGINEERING. (3)
Three lectures per week. Prerequisite: ENCE 200. Mechanisms of the behavior of materials under repeated, sustained and impact loads in relation to their environment. Influence of microstructure on mechanical properties. Fracture theory rheological aspects of the characteristics of selected materials.

ENCE 410 (125). ADVANCED STRENGTH OF MATERIALS. (3)
First semester. Three lectures per week. Prerequisite: ENES 220. Strength and deformation of deformable bodies, plane stress and strain. Torsion theory, unsymmetrical bending, curved beams. Behavior of beams, columns, slabs, plates and composite members unload. Elastic and inelastic stability.

ENCE 411 (126). EXPERIMENTAL STRESS ANALYSIS. (4)
Second semester. Three lectures and one laboratory per week. Application of experimental data on materials to design problems. Correlation of analytical and experimental methods of analysis with design. Electric strain gages, photoelasticity, brittle laquer methods and various analogies.

ENCE 412 (127). THEORY OF ELASTICITY AND PLASTICITY. (3)
Three lectures per week. Prerequisites: ENES 220 and ENCE 381. General formulation of the theory of mechanics of deformable media in terms of cartesian tensors. Plane state of stress, torsion of various shaped bars and thin walled sections. Bending and buckling of bars and thin plates. Introduction to the theory of plates and shells.

ENCE 440 (135). ADVANCED SOIL MECHANICS. (4)
Three lectures and one laboratory per week. Prerequisite: ENCE 340. Theories of strength, compressibility, capillarity and permeability. Critical review of theories and methods of measuring essential properties. Planning, execution and interpretation of soil testing programs.

ENCE 441 (136). SOIL-FOUNDATION SYSTEMS. (3)
Three lectures per week. Soil mechanics and foundation analysis are integrated in a systems approach to the design, synthesis, and interaction response of soil foundation-structural systems. Interaction of bearing capacity, settlements, lateral pressures, drainage, vibrations, stress distributions, etc., are included for a variety of structural systems.

ENCE 450 (165). STRUCTURAL ANALYSIS. (3)
First semester. Three lectures per week. Prerequisite: ENCE 351. Advanced indeterminate structures, members

of variable section, laterally loaded frames, continous stresses and secondary stresses.

ENCE 451 (166). STRUCTURAL DESIGN. (4)
Second semester. Three lectures and one laboratory per week. Prerequisite: ENCE 351. Steel and reinforced concrete design of bridges and buildings using appropriate controlling specifications. Advanced problems of modern steel and reinforced concrete.

ENCE 460 (104). COMPUTER ANALYSIS. (3)
Two lectures and one laboratory per week. Prerequisites: ENCE 360 anw ENCE 350. Computer methods and techniques applied to civil engineering problems with emphasis on structural systems.

SPECIAL TOPICS

ENCE 489 (199). SPECIAL PROBLEMS. (3)
Prerequisite: senior standing. A course arranged to meet the needs of exceptionally well prepared students for study in a particular field of civil engineering.

FOR GRADUATES

See *Graduate School Catalog* for descriptions.

ENVIRONMENTAL AND WATER RESOURCES ENGINEERING

ENCE 630 (241). HYDRAULIC ENGINEERING. (3)
ENCE 631 (242). ADVANCED HYDROLOGIC ANALYSIS. (3)
ENCE 632 (243). FREE SURFACE FLOW. (3)
ENCE 633 (277). THE CHEMISTRY OF NATURAL WATERS. (4)
ENCE 634 (280). AIR SAMPLING AND ANALYSIS. (3)
ENCE 635 (273). DESIGN OF WATER PURIFICATION FACILITIES. (3)
ENCE 636 (271). UNIT OPERATIONS OF ENVIRONMENTAL HEALTH ENGINEERING. (3)
ENCE 637 (275). BIOLOGICAL PRINCIPLES OF ENVIRONMENTAL HEALTH ENGINEERING. (4)
ENCE 733 (278). APPLIED WATER CHEMISTRY. (4)
ENCE 734 (279). AEROSOL SCIENCE AND TECHNOLOGY. (3)
ENCE 735 (274). DESIGN OF MUNICIPAL AND INDUSTRIAL WASTES TREATMENT FACILITIES. (3)
ENCE 736 (272). THEORY OF AQUEOUS AND SOLID WASTE TREATMENT AND DISPOSAL. (3)
ENCE 737 (276). INDUSTRIAL WASTES. (3)

TRANSPORTATION AND URBAN SYSTEMS ENGINEERING

ENCE 620 (261). URBAN-REGIONAL CIVIL ENGINEERING PLANNING (3)
ENCE 621 (262). CIVIL ENGINEERING PLANNING. (3)
ENCE 670 (281). HIGHWAY TRAFFIC CHARACTERISTICS AND MEASUREMENTS. (3)
ENCE 671 (282). HIGHWAY TRAFFIC OPERATIONS. (3)
ENCE 672 (283). TRANSPORTATION ENGINEERING PLANNING I. (3)
ENCE 673 (284). TRANSPORTATION ENGINEERING PLANNING II. (3)
ENCE 674 (285). RAIL TRANSPORTATION ENGINEERING. (3)
ENCE 675 (286). AIRPORT PLANNING AND DESIGN. (3)
ENCE 676 (287). HIGHWAY TRAFFIC FLOW THEORY. (3)

STRUCTURAL ENGINEERING

ENCE 600 (224). ADVANCED ENGINEERING MATERIALS LABORATORY (3)
ENCE 601 (225) ADVANCED PROPERTIES OF MATERIALS (3)
ENCE 602 (226) ADVANCED PROPERTIES OF MATERIALS (3)
ENCE 603 (227) THEORIES OF CONCRETE AND GRANULAR MATERIALS (3)
ENCE 604 (228). THEORIES OF CONCRETE AND GRANULAR MATERIALS. (3)
ENCE 610 (221). ADVANCED STRENGTH OF MATERIALS. (3)
ENCE 611 (222). ADVANCED STRENGTH OF MATERIALS. (3)
ENCE 612 (223). EXPERIMENTAL STRESS ANALYSIS. (3)
ENCE 640 (251). SOIL MECHANICS. (3)
ENCE 641 (252). ADVANCED FOUNDATIONS. (3)
ENCE 650 (255). DYNAMICS OF STRUCTURES. (3)
ENCE 651 (256). MATRIX METHODS OF STRUCTURAL ANALYSIS. (3)
ENCE 652 (257). ANALYSIS OF PLATE AND SHELL STRUCTURES. (3)
ENCE 653 (258). ADVANCED ELASTICITY. (3)
ENCE 654 (259). NONLINEAR THEORY OF SHELL STRUCTURES. (3)
ENCE 655 (260). PLASTIC ANALYSIS AND DESIGN OF STRUCTURES. (3)
ENCE 656 (263). THEORY OF STRUCTURAL DESIGN. (3)
ENCE 657 (264). THEORY OF STRUCTURAL DESIGN. (3)
ENCE 660 (296). ENGINEERING ANALYSIS AND COMPUTER PROGRAMMING. (3)
ENCE 661 (297). ENGINEERING ANALYSIS AND COMPUTER PROGRAMMING. (3)
ENCE 750 (265). BEHAVIOR OF STRUCTURES. (3)
ENCE 751 (266). BEHAVIOR OF STRUCTURES. (3)

SPECIAL TOPICS AND RESEARCH

ENCE 688 (290). ADVANCED TOPIC IN CIVIL ENGINEERING. (1-3)
ENCE 689 (298). SEMINAR. (Var.)
ENCE 799 (399). RESARCH. (Var.)
ENCE 899 (499). THESIS RESEARCH (Var.)

CO-OPERATIVE ENGINEERING EDUCATION

Director, DONALD J. BLAIR

ENCO 308 (108). CO-OP INTERNSHIP.
ENCO 309 (109). CO-OP INTERNSHIP.
Professional internship in industry or government agency provides the practical work experiences which supplement and enhance the theories, principles and practices studied in the normal educational program. The student should register for ENCO 308 for each summer internship. He should register for both ENCO 308 and ENCO 309 for each semester internship.

ELECTRICAL ENGINEERING

Professors: DeClaris, Chu, Lin, Newcomb, Popov, Price, Reiser, Rutelli (Emeritus), Shekel, Taylor, Wagner and Weiss.

Associate Professors: Abrams, Basham, Emad, Harger, Hochuli, Kim, Moore, Pugsley, Rao, Simons, Torres and Tretter.

Assistant Professors: Dooley, Friedman, Larson, Lee, LeVine, Lieberman, O'Grady, Opacic, Pinkston, Pryor, Rhee, Robinson, Rumbaugh, Siahatgar, Zajac and Zaki.

Lecturers: Colburn, Fordham, Morakis, Price, Schulman, Whicker.

Instructors: Glock and Littlepage.

Electrical engineering education is a good preparation for any of several careers—in research, development, design, production, sales, technical management, or teaching—within the broad area of the useful application of electrical and electronic phenomena. An increasing number of electrical engineering graduates have in recent years spe-

cialized in such fields as electronic computers, cybernetics and system engineering, automatic control, telemetry and space navigation, communications, radar, solid state device technology and biomedical engineering and bioelectronics. A smaller number of graduates with particular interests and abilities have been attracted to such pioneering area as biomedical electronics, electromechanical transducer design, design of particle accelerators, and other machines and instrumentation for use in research in physics, microminiaturization of electronic component assemblies, or antenna design. The traditional fields of electric power generation and transmission, radio, and television continue to offer satisfying careers to the electrical engineering graduate.

Increasingly, the boundary between electrical engineers and applied physicists or applied mathematicians becomes less distinct, particularly at the research level. The various branches of engineering similarly interact with each other, as technical problems become more sophisticated, and require a combined attack from several disciplines. The engineer occupies an intermediate position between science and the public, because, in addition to understanding the scientific principles of a situation, he is concerned with the timing, economics, and values that define the useful application of those principles.

In many cases, engineers have as a major duty the supervision of other engineers and of technicians. Hence, electrical engineering involves not only scientific knowledge, but also the ability and judgment to work effectively and communicate easily with many other people. Clearly, the desirable attributes for success vary from one career choice to another within electrical engineering. The specialist in creative research and advanced development needs graduate work to the M.S. or Ph.D. degree. An engineering sales representative, however, would in most cases begin to acquire the needed detailed awareness of current practice by taking a job immediately after the B.S. degree.

In this context of electrical engineering as a broad and diverse field, the goal of the Department is to provide an educational program and environment of challenge, so that the graduate will be well prepared to enter any of the areas of electrical engineering for which he is suited. To this end, the B.S. program makes provision for several technical electives, and the M.S. and Ph.D. graduate programs foster specialization through intensive research.

ELECTRICAL ENGINEERING CURRICULUM

	Semester	
Junior Year	I	II
MATH 246—Differential Equations	3	..
ENME 320—Thermodynamics	3	..
PHYS 371—Modern Physics for Engrs.	..	3
ENEE 380, 382—Engineering Electromagnetics I, II	3	3
ENEE 306—Circuit Analysis II	4	..
ENEE 307—Circuits Laboratory II	1	..
ENEE 310—Electronic Circuits I	..	4
ENEE 311—Electronics Laboratory I	..	1
Technical Electives*	..	3
General Education Courses	3	3
Total	17	17
Senior Year		
ENEE 320—Engineering Probability	2	..
ENEE 381—Engineering Electromagnetics III	3	..
ENEE 462—Transducers and Electrical Machinery	..	3
ENEE 463—Transducers and Electrical Machinery Laboratory	..	1
ENEE 312—Electronic Circuits II	4	..
ENEE 313—Electronics Laboratory II	1	..
ENME 420—Energy Conversion	..	3
Technical Electives*	5	7
General Education Courses	3	3
Total	18	17

* Of the 15 technical elective credits, all of which must be of 400 level, at least 3 credits must be in electrical engineering and at least 3 credits must be either from other fields of engineering, mathematics, physics, or other suitable scientific discipline. The student's elective program must be approved by his advisor. More than 15 credits may be taken.

Technical electives available in Electrical Engineering are described in the course listings later in this catalog. Any course numbered 400 to 499 inclusive that is not specifically excluded in its description may be used as part of a technical elective program. Approval by the student's faculty advisor of an in depth technical elective program is required.

Throughout the year students are urged to contact the Electrical Engineering Undergraduate Studies Office for advice or any other matters related to their studies.

For students planning to continue in graduate work, technical electives should be selected to provide the best possible preparation for the probable areas of graduate specialization.

FOR UNDERGRADUATE CREDIT

ENEE 206 (090). CIRCUIT ANALYSIS I. (4)
(See ENEE 207 for related laboratory course). Corequisites: MATH 241, PHYS 263, ENEE 207. Required of sophomores in electrical engineering. Introduction to circuit theory, Ohm's law, Kirchoff's laws, basic circuit analysis techniques, energy storage, power, elementary transients by classical and transform methods, sinusoidal analysis, introduction to complex frequency. ENEE 306 continues where ENEE 206 ends.

ENEE 207 (091). CIRCUITS LABORATORY I. (1)
Two hours of laboratory per week. Corequisite: ENEE 206. Required of sophomores in electrical engineering. Laboratory to be taken in associaton with ENEE 206. Electrical components and basic test equipment, principles of measurement and data handling, circuit behavior with variation in component values.

ENEE 300 (060). PRINCIPLES OF ELECTRICAL ENGINEERING. (3)

ENEE 301 (061). ELECTRICAL ENGINEERING LABORATORY. (1)

ENEE 302 (062). PRINCIPLES OF ELECTRICAL ENGINEERING. (3)
Prerequisites: MATH 241, PHYSICS 263. Corequisites: ENEE 301, 303. Required of aerospace, mechanical (ENEE 300 only) and chemical engineers. Not applicable in the electrical engineering major program. These courses are acceptable as prerequisites for some ad-

vanced ENEE courses. ENEE 300 includes analysis of linear systems, introduction to LaPlace transforms, steady-state A-C transforms, introduction to the concepts of electromagnetic fields and electric machines. ENEE 302 includes principles and circuit applications of semiconductor devices and electron tubes.

ENEE 303 (063). ELECTRICAL ENGINEERING LABORATORY. (1)
Two hours of laboratory per week. Corequisites, ENEE 300 (for ENEE 301) and ENEE 302 (for ENEE 303). Required of aerospace, mechanical, and (ENEE 301 only) chemical engineers. Experiments on the transient and steady-state response of linear circuits, electric machines, electron tubes and semiconductor devices.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

BIOMEDICAL

ENEE 410 (144). ELECTRONIC CIRCUITS. (3)
Prerequisite: ENEE 300 or equivalent knowledge of circuit theory or consent of the instructor. This course is intended for students in the physical sciences, and for engineering students requiring additional study of electron circuits. Credit not normally given for this course in an electrical engineering major program. (ENEE 311 or 313 may optionally be taken as an associated laboratory, as is appropriate). P-n junctions, transistors, vacuum tubes, biasing and operating point stability, switches, large-signal analysis, models, small-signal analysis, frequency response, feedback and multistage amplifiers, pulse and digital circuits.

ENEE 432 (146). ELECTRONICS FOR LIFE SCIENTISTS. (4)
Three hours of lecture and two hours of laboratory per week. Prerequisites: college algebra and a physics course, including basic electricity and magnetism. Not accepted for credit in an electrical engineering major program. The concept of an instrumentation system with emphasis upon requirements for transducers, amplifiers, and recording devices, design criteria and circuitry of power supplies amplifiers, and pulse equipment, specific instruments used for biological research, problems of shielding against hum and noise pickup and other interference problems characteristic of biological systems.

ENEE 433 (148). ELECTRONIC INSTRUMENTATION FOR PHYSICAL SCIENCE. (3)
Two hours of lecture and two hours of laboratory per week. Prerequisites: ENEE 300 or 306, PHYSICS 271 or equivalent, or consent of instructor. The concept of instrumentation systems from sensor to readout; discussions of transducers, system dynamics, precision and accuracy; measurement of electrical parameters; direct, differential, and potentiometric measurements; bridge measurements, time and frequency measurements, waveform generation and display.

ENEE 434 (—). INTRODUCTION TO ELECTRICAL PROCESSES IN BIOLOGY AND MEDICINE I. (3)
Prerequisite: ENEE 300 or equivalent. Introduction in the generation and processing of bioelectric signals including structure and function of the neuron, neuron models, membrane theory, generation and propagation of nerve impulses, synaptic mechanisms, transduction and neural coding and sensory events, central nervous system processing of sensory information and correlated electrical signals, control of effector organs, muscle contraction and mechanics, and analytical and instrumental techniques of nerve signal processing.

ENEE 435 (—). INTRODUCTION TO ELECTRICAL PROCESSES IN BIOLOGY AND MEDICINE II. (3)
Prerequisite: ENEE 434. Continuation of ENEE 434 with emphasis on the experimental and anlytical methods necessary to elucidate peripheral and central nervous system function, activity and information processing; acquisition and analysis of electrocardiograms; electromyograms and electroencephalograms.

ENEE 438 (—). TOPICS IN BIOMEDICAL ENGINEERING. (1-3)
Prerequisite: Permission of the instructor. May be taken for repeated credit. The content may vary from semester to semester. Selected topics of current interest from such areas as bioelectric systems, modelling, instrumentation, automated diagnostic, health-care delivery, etc.

CIRCUITS

ENEE 306 (120). CIRCUIT ANALYSIS II. (4)
(See ENEE 307 for related laboratory course). Prerequisite: ENEE 206. Corequisites: ENEE 307, MATH 246. Required of juniors in electrical engineering. Continuation of ENEE 206. Complex frequency and frequency response, application of both frequency-domain and time-domain concepts, mutual inductance and transformers, polyphase and time Fourier and LaPlace transform methods, driving point and transfer functions, controlled sources.

ENEE 307 (121). CIRCUIT LABORATORY II. (1)
Two hours of laboratory per week. Corequisite: ENEE 306. Required of juniors in electrical engineering. Laboratory to be taken in association with ENEE 306. Steady-state and transient circuit measurements, frequency response.

ENEE 310 (122). ELECTRONIC CIRCUITS I. (4)
(See ENEE 311 for related laboratory course). Prerequisite: ENEE 306. Corequisites: ENEE 311, and ENEE 380. Required of juniors in electrical engineering transistors and electron tubes, in DC, pulse, and small-signal situations, analysis of basic amplifiers, biasing, basic electronic switches, tuned and wideband amplifiers, feedback. ENEE 312 continues where ENEE 310 ends.

ENEE 311 (123). ELECTRONICS LABORATORY I. (1)
Two hours of laboratory per week. Corequisiet: ENEE 310. Required of juniors in electrical engineering. Laboratory to be taken in association with ENEE 310. Transistor and vacuum-tube characteristics, basic electronic switches, amplifiers, design practice. To the extent possible, work will be individual or in two-man squads.

ENEE 312 (124). ELECTRONIC CIRCUITS II. (4)
(See ENEE 313 for related laboratory course). Prerequisite: ENEE 310. Corequisites: ENEE 382, ENEE 311, and ENEE 313. Required of seniors in electrical engineering. Continuation of ENEE 310. Electron tubes and transistors in continuous-wave and public applications. Class C circuits, modulation and detection, pulse generation, delay and storage, feedback amplifiers.

ENEE 313 (125). ELECTRONICS LABORATORY II. (1)
Two hours of laboratory per week. Corequisite, ENEE 312. Required of seniors in electrical engineering. Laboratory to be taken in association with ENEE 312. Specification and design of electronic circuits. Students work as individuals or as responsible members of a project team.

ENEE 400 (150). NETWORK SYNTHESIS. (3)
Prerequisite: ENEE 306. Positive real functions, synthesis of driving-point impedances, network functions, approximation methods, Chebyshev and Butterworth filters.

ENEE 402 (172). ADVANCED PULSE TECHNIQUES. (3)
(See ENEE 403 for related laboratory course). Prerequisite: ENEE 312 or ENEE 410 or equivalent. Bistable, monostable, and astable circuits, sweep circuits, synchronization, counting, gates, comparators (magnetic core circuits, semiconductor and vacuum-tube circuits.

ENEE 403 (173). PULSE TECHNIQUES LABORATORY. (1)
Two hours of laboratory per week. Corequisite: ENEE 402 and permission of the instructor. Experiments on switching circuits, bistable, monstable, and astable circuits, sweep circuits, gates, comparators.

ENEE 404 (174). ADVANCED RADIO ENGINEERING. (3)
Corequisite: ENEE 312. (see ENEE 405 for related laboratory course). The coupling coefficient concept, high-frequency effects, design and optimization of amplifiers,

stability considerations, gain limitations, noise figure, design of harmonic generators, design of stable oscillators.

ENEE 405 (175). ADVANCED RADIO ENGINEERING LABORATORY. (1)
Two hours of laboratory per week. Corequisite: ENEE 404. Experiments on multiple tuned amplifiers, noise figure measurements, class-C amplifiers, varactors, modulators, projects.

ENEE 406 (190). MATHEMATICAL FOUNDATIONS OF CIRCUIT THEORY. (3)
Prerequisites: ENEE 306 and MATH 241, or equivalent. Review of determinants, linear equations, matrix theory, eigenvalues, theory of complex variables, inverse LaPlace transforms. Applications are drawn primarily from circuit analysis.

COMPUTERS

ENEE 440 (166). DIGITAL COMPUTER ORGANIZATION. (3)
Prerequisite: ENES 243 or CMSC 210 or equivalent. Same as CMSC 410. Introduction; computer elements; parallel adders and subtracters; micro-operations; sequences; computer simulation; organization of a commercially available stored program computer; microprogrammed computers; a large-scale batch-processing system (optional). (Intended for those minoring in computers and for those majoring in Computer Science).

ENEE 442 (112). INTRODUCTION TO COMPUTER-AIDED ANALYSIS AND DESIGN. (3)
Prerequisites: ENES 243, ENEE 310. Application of digital computers to solutions of lumped parameter system problems; use of simulators; economic and reliability considerations; investigation and applications of problem oriented programs such as those for circuit analysis, e.g. CORNAP, JOBSHOP, ECAP, and NASAP.) The use of the computer will be an integral part of the course.

ENEE 443 (100). INTRODUCTION TO COMPUTERS AND COMPUTATION. (3)
Prerequisite: ENES 243 or equivalent. Basic structure and organization of digital systems; representation of data, introduction to software systems; assembly language; application of computers in engineering and physical systems.

ENEE 444 (104). INTRODUCTION TO SWITCHING SYSTEM DESIGN. (3)
Prerequisite, ENEE 443. Symbolic logic and Boolean algebra; switching circuits; minimization algorithims; basic seqential circuits; design of digital systems.

ENEE 445 (163). DIGITAL LOGIC LABORATORY. (1)
Prerequisite: ENEE 443 or equivalent. Design, breadboard construction and checkout of simple digital systems such as counters, shift registers, arithmetic and control units.

ENEE 446 (106). FUNDAMENTALS OF COMPUTER SYSTEMS. (3)
Prerequisite: ENEE 444. Digital computer organization; arithmetic elements; primary and secondary storage; applications of integrated circuits; operating systems; interaction of hardware and software.

ENEE 450 (102). INTRODUCTION TO DISCRETE STRUCTURES. (3)
Prerequisite: ENES 243 or equivalent. This is the same course as CMSC 340. Review of set algebra including relations, partial ordering and mappings. Algebraic structures including semigroups and groups. Graph theory including trees and weighted graphs. Boolean algebra and propositional logic. Applications of these structures to various areas of computer science and computer engineering.

ENEE 451 (108). INTRODUCTION TO AUTOMATA THEORY. (3)
Prerequisite: ENEE 450 or permission of the instructor. An introduction to finite state machines and their properties; properties of regular sets; elementary decomposition results; introduction to Turing machines and computability theory; undecidability propositions; introduction to finite semigroups with application to the decomposition of finite state machines.

ENEE 456 (160). ANALOG AND HYBRID COMPUTERS. (3)
Prerequisite: ENEE 310. Programming the analog computer; analog computing components; error analysis, repetitive operation; synthesis of systems using the computer; hybrid computer systems.

COMMUNICATION AND CONTROL

ENEE 320 (142). ENGINEERING PROBABILITY. (2)
Prerequisites: MATH 241 and ENEE 206. Required of electrical engineering majors. Probability theory, discrete and continuous, statistical distribution functions and their parameters, applications to electrical engineering.

ENEE 420 (156). COMMUNICATION THEORY. (3)
Prerequisite: ENEE 320. Random signals: elements of random processes, noise, Gaussian process, correlation functions and power spectra, linear operations; optimum receivers, vector waveform channels, receiver implementation, probability of error performance; efficient signaling: sources, encoding, dimensionality, channel capacity; waeform communication: linear, angle, and pulse modulation.

ENEE 421 (157). INTRODUCTION TO INFORMATION THEORY. (3)
Prerequisite: ENEE 320. Definition of information and entropy; characterization of sources; Kraft and MacMillan inequalities; coding information sources; noiseless coding theorem; channels and mutual information; Shannon's coding theorem for noisy channels.

ENEE 425 (158). SIGNAL ANALYSIS, MODULATION AND NOISE. (3)
Prerequisites: ENEE 310 and ENEE 320. Signal transmission through networks, transmission in the presence of noise, statistical methods of determining error and transmission effects, modulation schemes.

ENEE 460 (154). FEEDBACK CONTROL SYSTEMS. (3)
Prerequisites: MATH 246 and ENEE 310. (see ENEE 461 for related laboratory course). Feedback system operation and design, stability criteria, basic design techniques, correlation of time and frequency-domain concepts, flow-graph algebra, system synthesis to a variety of specifications.

ENEE 461 (155). FEEDBACK CONTROL SYSTEMS LABORATORY. (1)
Two hours of laboratory per week. Corequisite: ENEE 460. Projects to enhance the student's understanding of feedback control systems and familiarize him with some of the devises used in the control field.

ELECTRO PHYSICS

ENEE 380 (130). ELECTROMAGNETIC THEORY. (3)
Three hours of lecture per week. Prerequisites: MATH 241, PHYS 262, ENEE 206 with an average grade of C or better in MATH 240, 241, PHYS 161, 262, and ENEE 206. Required of juniors in Electrical Engineering. Introduction to electromagnetic fields. Electrostatics; Coulomb's law, Gauss' law, electrical potential, capacitance, Laplace's equation and boundary value problems. Magnetostatics; Biot-Savart law, Ampere's law. Lorentz force equation, magnetic materials, inductance. Time varying fields and Maxwell's equations.

ENEE 381 (134). ELECTROMAGNETIC WAVE PROPAGATION. (3)
Three hours lecture per week. Prerequisite: ENEE 380. Required of seniors in electrical engineering. The wave equation and the impedance concept; plane waves; reflection and refraction; wave guides and transmission lines; Smith charts; lumped models.

ENEE 382 (132). ELECTROMAGNETIC PROPERTIES OF MATERIALS. (3)
Three hours lecture per week. Prerequisite: ENEE 380.

Required of seniors in electrical engineering. Review of Maxwell's equations; the wave equation; electron dynamics with applications to accelerators; dielectrics; the dielectric model for plasmas; plane waves in magnetoplasmas. Introduction to quantum mechanics and quantum statistics; theory of semi-conductors. Ferromagnetism and selected topics.

ENEE 383 (135). ELECTROMAGNETIC MEASUREMENTS LABORATORY. (1)
Two hours of laboratory per week. Corequisite: ENEE 381. Laboratory to be taken in association with ENEE 381. Experiments on field mapping, transmission line matching, impedance measurement, microwave measurements of standing wave ratio, power, frequency, Q, and coupling.

ENEE 462 (140). TRANSDUCERS AND ELECTRICAL MACHINERY. (3)
(See ENEE 463 for related laboratory course). Prerequisites: ENEE 306, ENEE 382. Corequisite: ENEE 463. Required of seniors in electrical engineering. Electromechanical transducers, theory of electromechanical systems, power and wideband transformers, rotating electrical machinery from the theoretical and performance points of view.

ENEE 463 (141). TRANSDUCERS AND ELECTRICAL MACHINERY LABORATORY. (1)
Two hours of laboratory per week. Corequisite: ENEE 462. Required of seniors in electrical engineering. Laboratory to be taken in association with ENEE 462. Experiments on transformers, synchronous machines, induction motors, synchros, loudspeakers, other transducers.

ENEE 481 (170). ANTENNAS AND WAVE PROPAGATION. (3)
Corequisite: ENEE 381. Review of Maxwell's Equations, radiation, antennas, radio wave propagation.

ENEE 487 (186). PARTICLES ACCELERATORS, PHYSICAL AND ENGINEERING PRINCIPLES. (3)
Three hours of lecture per week. Prerequisites: ENEE 380, and PHYS 420, or consent of the instructor. Sources of charged particles; methods of acceleration and focusing of ion beams in electromagnetic fields; basic theory, design, and engineering principles of particle accelerators.

ENEE 496 (188). PHYSICAL ELECTRONICS OF DEVICES. (3)
Three hours of lecture per week. Prerequisite: PHYS 420 and ENEE 382. Introduction to electron and ion optics. Principles of vacuum tubes, klystrons and magnetrons. Conductivity of metals and semiconductors. P-n junction and transistors.

SPECIAL TOPICS

ENEE 418 (181). PROJECTS IN ELECTRICAL ENGINEERING (1-3)
Hours to be arranged. Prerequisites: senior standing and permission of the instructor. May be taken for repeated credit up to a total of 4 credits, with the permission of the student's advisor and the instructor. Theoretical and experimental projects.

ENEE 488 (180). TOPICS IN ELECTRICAL ENGINEERING. (3)
Prerequisite: permission of the instructor. May be taken for repeated credit up to a total of 6 credits, with the permission of the student's advisor and the instructor.

In the Academic Year 1971-72 the following special topics courses are offered:

A. ELECTRICAL PROCESSES IN BIOLOGY & MEDICINE I.
B. ELECTRICAL PROCESSES IN BIOLOGY & MEDICINE II.
C. ACTIVE NETWORK SYNTHESIS.
D. INTRODUCTION TO LINEAR SYSTEM THEORY.
E. REMOTE SENSING OF THE ENVIRONMENT.
F. SOFTWARE ENGINEERING.

BIOMEDICAL

ENEE 632 (245). ELECTRICAL TECHNIQUES IN MEDICINE AND BIOLOGY. (3)

CIRCUITS

ENEE 600 (230). MATHEMATICS OF CIRCUIT ANALYSIS. (3)
ENEE 601 (231). ACTIVE NETWORK ANALYSIS. (3)
ENEE 602 (202). TRANSIENTS IN LINEAR SYSTEMS I. (3)
ENEE 603 (203). TRANSIENTS IN LINEAR SYSTEMS II. (3)
ENEE 604 (204). ADVANCED ELECTRONIC CIRCUIT DESIGN. (3)
ENEE 605 (234). GRAPH THEORY IN NETWORK ANALYSIS. (3)
ENEE 700 (232). NETWORK SYNTHESIS I. (3)
ENEE 701 (233). NETWORK SYNTHESIS II. (3)
ENEE 703 (284). SEMICONDUCTOR DEVICE MODELS. (3)
ENEE 707 (235). APPLICATIONS OF TENSOR ANALYSIS. (3)

COMMUNICATIONS

ENEE 620 (218). RANDOM PROCESSES IN COMMUNICATION AND CONTROL. (3)
ENEE 621 (219). ESTIMATION AND DETECTION THEORY. (3)
ENEE 630 (225). ADVANCED TOPICS—RADAR SIGNALS AND SYSTEMS. (3)
ENEE 721 (221). INFORMATION THEORY. (3)
ENEE 722 (224). CODING THEORY. (3)
ENEE 728 (220). ADVANCED TOPICS IN COMMUNICATION THEORY. (3)
ENEE 730 (226). ADVANCED TOPICS—RADAR SIGNALS AND SYSTEMS. (3)

COMPUTERS

ENEE 640 (260). ARITHMETIC AND CODING ASPECTS OF DIGITAL COMPUTERS. (3)
ENEE 646 (270). DIGITAL COMPUTER DESIGN. (3)
ENEE 651 (261). CODING THEORY AND APPLICATIONS. (3)
ENEE 652 (265). AUTOMATA THEORY. (3)
ENEE 654 (262). COMBINATORIAL SWITCHING THEORY. (3)
ENEE 655 (263). STRUCTURE THEORY OF MACHINES. (3)
ENEE 657 (276). SIMULATION OF DYNAMIC SYSTEMS. (3)
ENEE 746 (274). DIGITAL SYSTEMS ENGINEERING. (3)
ENEE 748 (272). TOPICS IN COMPUTER DESIGN. (1-3)

CONTROLS

ENEE 660 (212). CONTROL SYSTEMS ANALYSIS AND SYNTHESIS. (3)
ENEE 661 (213). NON-LINEAR AND ADAPTIVE CONTROL SYSTEMS. (3)
ENEE 662 (238). SAMPLED-DATA CONTROL SYSTEMS. (3)
ENEE 663 (236). SYSTEM THEORY. (3)
ENEE 664 (239). OPTIMIZATION AND CONTROL. (3)
ENEE 760 (237). MATHEMATICS OF OPTIMIZATION. (3)
ENEE 769 (240). ADVANCED TOPICS IN CONTROL THEORY. (3)

ELECTROPHYSICS

ENEE 608 (222). GRADUATE SEMINAR. (1-3)
ENEE 648 (223). ADVANCED TOPICS IN ELECTRICAL ENGINEERING. (3)
ENEE 680 (200). ELECTROMAGNETIC THEORY I. (3)
ENEE 681 (201). ELECTROMAGNETIC THEORY II. (3)
ENEE 683 (250). MATHEMATICS FOR ELECTROMAGNETISM. (3)
ENEE 686 (290). CHARGED PARTICLE DYNAMICS, ELECTRON AND ION BEAMS. (3)

ENEE 696 (282). INTEGRATED AND MICROWAVE ELECTRONICS. (3)
ENEE 697 (283). SEMICONDUCTOR DEVICES AND TECHNOLOGY. (3)
ENEE 780 (206). MICROWAVE ENGINEERING. (3)
ENEE 781 (207). OPTICAL ENGINEERING. (3)
ENEE 782 (215). RADIO WAVE PROPAGATION I. (3)
ENEE 783 (216). RADIO WAVE PROPAGATION II. (3)
ENEE 784 (251). ANTENNA THEORY. (3)
ENEE 791 (209). QUANTUM ELECTRONICS. (3)
ENEE 793 (210). SOLID STATE ELECTRONICS. (3)
ENEE 799 (399). THESIS RESEARCH. (Master's Level) (Var.)
ENEE 899 (499). DISSERTATION RESEARCH. (Doctoral Level) (Var.)

ENGINEERING MATERIALS

Professors: Armstrong*, Arsenault, Asimow*, Marcinkowski*, and Skolnick**.
Associate Professors: Bolsaitis**, and Spain**.

Engineering materials involves the relation between structure and properties of materials. The principles of physics, chemistry and mathematics are applied to metals, ceramics, polymers and composite materials used in manufacturing and research. In addition to the traditional area of metallurgy, engineering materials includes the fields of solid state physics and polymer and materials science and their application to modern industrial problems. Because of the extensive use of materials, the engineer finds a wide variety of interesting career opportunities in many companies and laboratories.

Programs of study in engineering materials at the undergraduate and graduate level are offered through the Chemical and Mechanical Engineering Departments. Students may use Engineering Materials as a field of concentration in the Bachelor of Science in Engineering Program.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

ENMA 462 (162). DEFORMATION OF ENGINEERING MATERIALS. (3)
Prerequisites: ENES 230 or consent of instructor. Relationship of structure to the mechanical properties of materials. Elastic and plastic deformation, microscopic yield criteria, state of stress and ductility. Elements of dislocation theory, work hardening, alloy strengthening, creep, and fracture in terms of dislocation theory.

ENMA 463 (163). CHEMICAL, LIQUID AND POWDER PROCESSING OF ENGINEERING MATERIALS. (3)
Prerequisites: ENES 230 or consent of instructor. Methods and processes used in the production of primary metals. The detailed basic principles of beneficiation processes, pyrometallurgy, hydrometallurgy, electrometallurgy, vapor phase processing and electroplating. Liquid metal processing including casting, welding, brazing and soldering. Powder processing and sintering. Shapes and structures produced in the above processes.

ENMA 464 (164). ENVIRONMENTAL EFFECTS ON ENGINEERING. (3)
Prerequisites: ENES 230 or consent of instructor. Introduction to the phenomena associated with the resistance of materials to damage under severe environmental conditions. Oxidation, corrosion, stress corrosion, corrosion fatigue and radiation damage are examined from the point of view of mechanism and influence on the properties of materials. Methods of corrosion protection and criteria for selection of materials for use in radiation environments.

ENMA 470 (170). STRUCTURE AND PROPERTIES OF ENGINEERING MATERIALS. (3)
A comprehensive survey of the atomic and electronic structure of solids with emphasis on the relationship of structure to the physical and mechanical properties.

ENMA 471 (171). PHYSICAL CHEMISTRY OF ENGINEERING MATERIALS. (3)
Equilibrium multicomponent systems and relationship to the phase diagram. Thermodynamics of polycrystalline and polyphase materials. Diffusion in solids, kinetics of reactions in solids.

ENMA 472 (172). TECHNOLOGY OF ENGINEERING MATERIALS. (3)
Relationship of properties of solids to their engineering applications. Criteria for the choice of materials for electronic, mechanical and chemical properties. Particular emphasis on the relationships between structure of the solid and its potential engineering application.

ENMA 473 (173). PROCESSING OF ENGINEERING MATERIALS. (3)
The effect of processing on the structure of engineering materials. Processes considered include refining, melting and solidification, purification by zone refining, vapor phase processing, mechanical working and heat treatments.

FOR GRADUATES

See *Graduate School Catalog* for descriptions.

ENMA 650 (350). STRUCTURE OF ENGINEERING MATERIALS. (3)
ENMA 651 (351). ELECTRONIC STRUCTURE OF ENGINEERING MATERIALS. (3)
ENMA 659 (359). SPECIAL TOPICS IN STRUCTURE OF ENGINEERING MATERIALS. (3)
ENMA 660 (360). CHEMICAL PHYSICS OF ENGINEERING MATERIALS. (3)
ENMA 661 (361). KINETICS OF REACTIONS IN MATERIALS. (3)
ENMA 669 (369). SPECIAL TOPICS IN THE CHEMICAL PHYSICS OF MATERIALS. (3)
ENMA 670 (370). RHEOLOGY OF ENGINEERING MATERIALS. (3)
ENMA 671 (371). DISLOCATIONS IN CRYSTALLINE MATERIALS. (3)
ENMA 672 (372). MECHANICAL PROPERTIES OF ENGINEERING MATERIALS. (3)
ENMA 679 (379). SPECIAL TOPICS IN THE MECHANICAL BEHAVIOR OF ENGINEERING MATERIALS. (3)
ENMA 680 (380). EXPERIMENTAL METHODS IN MATERIALS SCIENCE. (3)
ENMA 681 (381). DIFFRACTION TECHNIQUES IN MATERIALS SCIENCE. (3)
ENMA 689 (389). SPECIAL TOPICS IN EXPERIMENTAL TECHNIQUES IN MATERIALS SCIENCE. (3)
ENMA 690 (390). POLYMERIC ENGINEERING MATERIALS. (3)
ENMA 691 (391). SPECIAL TOPICS IN ENGINEERING MATERIALS. (3)
ENMA 697 (397). SEMINAR IN ENGINEERING MATERIALS. (1)
ENMA 698 (398). SPECIAL PROBLEMS IN ENGINEERING MATERIALS. (Var.)
ENMA 799 (399). THESIS RESEARCH. (Master's Level) (Var.)
ENMA 899 (499). DISSERTATION—RESEARCH. (Doctoral Level) (Var.)

*Member of Mechanical Engineering Department.
**Member of Chemical Engineering Department.

ENGINEERING SCIENCES

ENES 101 (001). INTRODUCTORY ENGINEERING SCIENCE. (3)
One lecture and two laboratory periods a week. Basic languages of the engineer. Elements of graphic com-

munication and analysis. Orthographic projection and descriptive geometry, conventions, graphs and curve-fitting. Vectors as tools of communication and analysis. Applications of geometry to engineering problems.

ENES 110 (010). MECHANICS. (3)
Two lectures and two drill periods a week. Prerequisites ENES 101, and concurrent registration in MATH 140 or approval of department chairman. Systems of rigid bodies in equilibrium under action of forces and couples. Numerical, graphical, and vectoral computation applied to problems in statics and elementary dynamics.

ENES 220 (020). MECHANICS OF MATERIALS. (3)
Three lectures a week. Prerequisites: MATH 141, PHYS 161, and ENES 110. Distortion of engineering materials in relation to changes in stress or temperature. Geometry of internal strain and external displacement. Application to beams, columns, shafts, tanks, and other structural, machine and vehicle members.

ENES 221 (021). DYNAMICS. (3)
Three lectures a week. Prerequisites: MATH 141, PHYS Three lectures a week. Prerequisites: ENES 110, and concurrent registration in MATH 240 and PHYS 262. Systems of heavy particules and rigid bodies at rest and in motion. Force-acceleration, work-energy and impulse-momentum relationships. Motion of one body relative to another in a plane and in space.

ENES 230 (030). MATERIALS SCIENCE. (3)
Three lectures a week. Prerequisite: ENES 220. Basic principles, nature, and properties of engineering materials. Structure of matter, phase transformations and mechanical properties of metals, ceramics, polymers and related materials, electrical, thermal and magnetic properties, corrosion and radiation damage, friction and wear, diffusion.

ENES 240 (080). ALGORITHMIC ANALYSIS AND COMPUTER PROGRAMMING. (2)
One hour of lecture and two hours of laboratory per week. Corequisite: MATH 240. Required of sophomores in electrical engineering. Concept and properties of algorithms (fully defined procedures for solving problems), problems from numerical mathematics, use of specific algorithmic language (MAD), completion of several projects using a digital computer.

ENES 243 (083). DIGITAL COMPUTER LABORATORY. (1)
Two hours of laboratory per week. Prerequisite: ENES 240. Required of sophomores in electrical engineering. Completion of several projects in numerical mathematics on a digital computer, with emphasis of efficiency of computation accuracy of approximations and control of errors.

FIRE PROTECTION ENGINEERING

Professor: Bryan.
Assistant Professor: Hickey.
Lecturer: Custer.

Fire protection is concerned with the scientific and technical problems of preventing loss of life and property from fire, explosion and related hazards, and of evaluating and eliminating hazardous conditions.

The fundamental principles of fire protection are relatively well-defined and the application of these principles to a modern industrialized society has become a specialized activity. Control of the hazards in manufacturing processes calls for an understanding not only of measures for fire protection but of the processes themselves. Often the most effective solution to the problem of safeguarding a hazardous operation lies in the modification of the process rather than in the installation of special extinguishing equipment. The expert in fire protection must be prepared to decide in any given case what is the best and most economical solution of the fire prevention problem. His recommendations are often based not only on sound principles of fire protection but on a thorough understanding of the special problems of the individual property.

Modern fire protection utilizes a wide variety of mechanical and electrical equipment which the student must understand in principle before he can apply them to special problems. The fire protection curriculum emphasizes the scientific, technical and humanitarian aspects of fire protection and the development of the individual student.

The problems and challenges which confront the specialist in fire protection include the reduction and control of fire hazards due to processes subject to fire or explosion in respect to design, installation and handling, involving both physical and human factors; the use of buildings and transportation facilities to restrict the spread of fire and to facilitate the escape of occupants in case of fire; the design, installation and maintenance of fire detection and extinguishing devices and systems; and the organization and education of persons for fire prevention and fire protection.

FIRE PROTECTION CURRICULUM

	Semester I	Semester II
Junior Year		
General Education Courses	3	3
ENEE 300—Principles of Elec. Engr.	..	3
ENES 230—Materials Science or ENCE 200—Fundamentals of Engineering Materials	3	..
ENCE 381—Applied Math in Engr. or MATH 246—Differential Equations	3	..
ENCE 330—Fluid Mechanics	..	3
ENFP 310—Installations and Equipment	3	..
ENFP 312—Fire Prot. Fluids and Systems	..	3
ENFP 314—Water Suppression Systems	..	3
ENFP 320—Construction Fundamentals and Ins. Schedules	3	..
Approved Electives	2 or 3	2 or 3
Total	17 or 18	17 or 18
Senior Year		
General Education Courses	3	3
ENME 320—Thermodynamics	3	..
ENCE 360—Engineering Analysis and Computer Programming	3	..
ENME 410—Operations Research I or BSAD 332—Operations Research I	..	3
ENNU 410—Environmental Consideration of Nuclear Engineering	..	3
ENFP 411—Process and Transportation Hazards	..	3
ENFP 314—Fire Analysis	3	..
ENFP 416—Problem Synthesis and Design	3	..
ENFP 417—Technical Projects	..	3
Approved Technical Electives	3	3
Total	18	18

ENFP 280 (080). FIRE PROTECTION ORGANIZATION. (3)
First semester. Two lectures and one laboratory period a week. Fire loss records and the economic aspects of fire Costs. Organization and administration of municipal and industrial fire protection.

ENFP 290 (090). ESSENTIALS OF FIRE PROTECTION. (3)
Second semester. Two lectures and one laboratory period a week. Prerequisites: ENFP 280. Chemistry of combustion and an analysis of the properties of materials affecting fire behavior. Detailed examination of the basic fire phenomenon.

ENFP 310 (110). INSTALLATIONS AND EQUIPMENT. (3)
First semester. Two lectures and one laboratory period a week. Prerequisites: ENFP 290 and junior standing. The design and installation of gaseous and solid particle suppression systems. Design standards and specifications for installation of detection signaling and communication systems. The principles of suppression theory applied to laboratory problems.

ENFP 312 (112). FIRE PROTECTION FLUIDS AND SYSTEMS. (3)
Second semester. Two lectures and one laboratory period a week. Corequisite: ENFP 415. Fluids utilized in fire suppression systems and operations. Laboratory study of operational and hydraulics problems. Design of water supply and distribution for fire protection.

ENFP 314 (114). FIRE ANALYSIS. (3)
First semester. Two lectures and one laboratory period a week. Prerequisite: ENFP 312. The mass fire problem, with consideration of conflagrations and fire storms, thermal, structural, environmental, and meterological factors, techniques of prediction and continuity analysis.

ENFP 320 (120). CONSTRUCTION FUNDAMENTALS AND INSURANCE SCHEDULES. (3)
First semester. Two lectures and one laboratory period a week. Prerequisite: ENFP 280. A study of the insurance rating schedules and their principles of application. Functional and structural aspects of construction affected by the variables of the fire environment. The examination of specific laws, codes and ordinances. Laboratory examination of fire test procedures.

ENFP 411 (111). PROCESS AND TRANSPORTATION HAZARDS. (3)
Second semester. Two lectures and one laboratory period a week. Prerequisite: ENFP 310. Special hazards of industrial processing and manufacturing, the transportation of personnel and products. Analytical approach to hazard evaluation and control. Variables affecting control design in relation to probability, reliability, economic, legal, and psychological factors.

ENFP 415 (115). WATER SUPPRESSION SYSTEMS. (3)
Second semester. Two lectures and one laboratory period a week. Prerequisite: ENFP 310. Corequisite: ENFP 312. The design and installation of automatic sprinkler, water spray systems. Computation of water flow, pressure and system loss characteristics. Development of hydraulically balanced flow characteristics. Laboratory sessions on design and evaluation procedures.

ENFP 416 (116). PROBLEM SYNTHESIS AND DESIGN. (3)
First semester. Two lectures and one laboratory period a week. Prerequisite: senior standing. Techniques and procedures of problem orientation and solution design utilizing logical and numerical procedures. Fundamentals of a systems approach. Study of historical, current and future problems. Probability statistics as applied to fire protection problems.

ENFP 417 (117). TECHNICAL PROJECTS. (3)
Second semester. Two lectures and one laboratory period a week. Prerequisite: ENFP 416. An examination of the specialized areas of fire protection and the state of the research in these areas. Student development and discussion of research projects in a selected area.

MECHANICAL ENGINEERING

Professors: Dally, Shreeve, Jackson, R. W. Allen, Armstrong, Asimow, Berger, Cunniff, Hsu, John, Marcinkowski, Sayre, Talaat, Weske.
Associate Professors: Anand, Hayleck, Wockenfuss, Fourney, Marks, Sallet, Walston, Yang.
Assistant Professors: Buckley, Elkins, Forsnes, Hill, Morse, Owens, Tsui.
Instructors: Becker, Morin, Owens, Puckett, Alic, Hagner, Hasson, Hawks, Kauffmann, Mahajan, Root, Whitbeck.
Lecturers: Dawson, Seigel.

The principal function of the mechanical engineer is to apply science and technology creatively to the design and manufacture of machines for the practice use of mankind. Any machine or manufactured product requires basically, (1) the art and science of generating, transmitting and utilizing mechanical power, and (2) research, development, design, and the coordination of materials, personnel, and management. These basic requirements define mechanical engineering. The following professional divisions of the American Society of Mechanical Engineers give a good idea of types of work in which the mechanical engineer may become associated: air pollution, applied mechanics, automatic control, aviation and space, biomechanical and human factors, design engineering, diesel and gas engine power, energetics, fluid engineering, fuels, gas turbine, heat transfer, management, materials handling, metals engineering, nuclear engineering, petroleum, power, pressure vessels and piping, process industries, railroad, rubber and plastics, safety, solar energy, textile, and underwater technology.

There are numerous opportunities in all the fields associated with these divisions, in particular in the areas of research, design, systems analysis, management, consulting, maintenance, production, teaching, and sales.

Because of the wide variety of engineering opportunities available to the mechanical engineer, the curriculum is designed to give the student a thorough training in the basic and engineering sciences: physics, chemistry, mathematics, solid and fluid mechanics, dynamics, thermodynamics, heat transfer, materials, electricity, nuclear technology, power, and design. This curriculum leads to the Bachelor of Science degree, which is the stepping stone to immediate employment and/or continued study to the Master of Science and Doctor of Philosophy degrees.

MECHANICAL ENGINEERING CURRICULUM

	Semester	
Junior Year	I	II
General Education Courses	3	3
ENEE 300, 302—Principles of Electrical Engineering	3	3
ENEE 301, 303—Electrical Engr. Lab.	1	1
ENES 230—Materials Science	3	..
ENME 360—Dynamics of Machinery	2	..
ENME 340—Fluid Mechanics I	3	..
ENME 300—Materials Engineering	..	3
ENME 341—Gas Dynamics	..	3
ENME 321—Transfer Processes	..	3
ENME 381—Measurements Laboratory	..	2
ENME 380—Applied Mathematics in Engineering	3	..
Total	18	18

Senior Year		
General Education Courses	3	3
ENME 421, 422—Energy Conversion	4	3
ENME 400—Machine Design	3	
ENME 480, 481—Engineering Experimentation	2	2
ENME 401, 402—Mechanical Engineering Analysis and Design	3	4
Technical Elective	3	6
Total	18	18

Technical Electives	
ENME 382—Engineering Analysis	3
ENME 460—Elasticity and Plasticity I	3
ENME 461—Dynamics II	3
ENME 424—Thermodynamics II	3
ENME 488—Special Problems	3
ENME 423—Environmental Engineering	3
ENME 442—Fluid Mechanics II	3
ENME 403—Automatic Controls	3
ENME 410—Introduction to Operations Research I	3
ENME 411—Introduction to Industrial Engineering	3
ENME 450—Mechanical Engineering Analysis for Oceanic Environment	3
ENME 451—Mechanical Engineering Systems for Underwater Operations	3
ENME 462—Introduction to Engineering Acoustics	3

In the Mechanical Engineering Department there are five main divisions of specialization both at the undergraduate and graduate levels. These include design and systems analysis; energy; fluid mechanics; materials; and solid mechanics. A graduate student may major in one of these fields with a minor in one or more of the others. Opportunities are also available for a student to take advanced work in engineering management and operations research (under design and systems analysis), marine and ocean engineering (under fluid mechanics), bio-mechanical engineering and environmental engineering (under energy), or acoustics, experimental stress analysis and bio-mechanics (under solid mechanics).

The materials courses are listed under a separate heading in this catalog.

Students planning graduate work should preferably choose electives to provide the best background for their main areas of interest. The areas of current specialization and research in mechanical engineering at the University of Maryland are:

I Design and Systems Analysis
- a. Mechanical engineering design
- b. Controls systems analysis
- c. Engineering management and operations research

II Energy
- a. Thermodynamics
- b. Heat transfer
- c. Energy conversion
- d. Propulsion

III Fluid mechanics
- a. Incompressible flow
- b. Compressible flow
- c. Viscous flow
- d. Unstead hydrodynamics
- e. Marine and ocean engineering

IV Solid mechanics
- a. Dynamics
- b. Continuum mechanics
- c. Elasticity, linear and non-linear
- d. Stress-waves
- e. Vibrations, linear, non-linear
- f. Plasticity
- g. Viscoelasticity
- h. Shells, linear and non-linear
- i. Structural dynamics
- j. Acoustics

V Materials

See listing under Engineering Materials section.

ENME 200 (015). MECHANICAL ENGINEERING ANALYSIS. (2)
Two lectures a week. Prerequisites: MATH 141, PHYS 161 and CHEM 104. Development of the student's capacity to solve engineering problems by the application of fundamental principles and fully defined procedures. Several projects require the use of a computer.

ENME 215 (050). PRINCIPLES OF MECHANICAL ENGINEERING. (3)
Three lectures a week. Prerequisites: PHYSICS 263, MATH 240. Required of civil engineers. Laws and corollaries of classical thermodynamics. Properties and characteristics of pure substances and perfect gases. Vapor and gas cycles. Mixture of gases including applications to psychrometry. Introduction to heat transfer.

ENME 216 (060). THERMODYNAMICS I. (3)
Two lectures and one laboratory period a week. Prerequisites: PHYSICS 262, MATH 240 concurrently. Required of sophomores in mechanical and aeronautical engineering. Properties, characteristics and fundamental equation of gases and vapors. Application of first and second laws of thermodynamics in the analysis of basic heat engines, air compression and vapor cycles. Flow and non-flow processes for gases and vapors.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

DESIGN AND SYSTEMS ANALYSIS

ENME 300 (103). MATERIALS ENGINEERING. (3)
Two lectures and one laboratory period a week. Prerequisite: ENES 230. Processes and methods to manufacture and usefully apply engineering materials, alloys and heat treatment of steel, strengthening processes for ferrous and non-ferrous alloys. Fabrication techniques for metals, polymers and refractories. Specification, inspection, control and automation.

ENME 400 (152). MACHINE DESIGN. (3)
Two lectures and one laboratory period a week. Prerequisites: ENME 360, 300. Working stresses, stress concentration, stress analysis and repeated loadings. Design of machine elements. Kinematics of mechanisms.

ENME 401 (156). MECHANICAL ENGINEERING ANALYSIS AND DESIGN. (3)

ENME 402 (157). MECHANICAL ENGINEERING ANALYSIS AND DESIGN. (4)
First semester, two lectures and one laboratory period per week. Second semester two lectures and two laboratory periods per week. Prerequisite, senior standing in mechanical engineering. Creative engineering and problem analysis. Systems design including control reliability and manufacturing requirements. Use of computers in design. Design of multi-variable systems.

ENME 403 (165). AUTOMATIC CONTROLS. (3)
Three lectures per week. Prerequisites: ENEE 302, senior standing. Hydraulic, electrical, mechanical and pneumatic automatic control systems. Open and closed loops. Steady state and transient operation, stability criteria, linear and non-linear systems. LaPlace transforms.

ENME 410 (167). OPERATIONS RESEARCH I. (3)
Three lectures a week. Prerequisite: senior standing in mechanical engineering. Applications of linear programming, queuing model, theory of games and competitive models to engineering problems.

ENME 411 (168). INTRODUCTION TO INDUSTRIAL ENGINEERING. (3)
Three lectures per week. Prerequisites: ENME 300 and ECON 205 or consent of instructor. This course is concerned with the design, improvement and installation of integrated systems of men, materials and equipment. Areas covered include industrial activities, plant layout and design, value analysis, engineering economics, quality and production control, methods engineering, industrial relations, etc.

ENERGY

ENME 320 (100). THERMODYNAMICS. (3)
Two lectures and one laboratory period a week. Prerequisites: PHYSICS 262, MATH 240. The properties, characteristics and fundamental equations of gases and vapors. Application of the first and second laws of thermodynamics in the analysis of basic heat engines, air compression and vapor cycles. Flow and non-flow processes for gases and vapors.

ENME 321 (106). TRANSFER PROCESSES. (3)
Three lectures a week. Prerequisite, ENME 340. Conduction by steady state and variable heat flow, laminar and turbulent flow, free and forced convection, radiation, evaporation and condensation of vapors. Transfer of mass, heat, and momentum.

ENME 420 (107). ENERGY CONVERSION. (3)
Three lectures a week. Prerequisite: ENME 330. Required of seniors in electrical engineering. Chemical, heat, mechanical, nuclear and electrical energy conversion processes, cycles and systems. Direct conversion processes of fuel cells, thermionics and magnetohydromechanics.

ENME 421 (150). ENERGY CONVERSION. (4)

ENME 422 (151). ENERGY CONVERSION. (3)
First semester. Three lectures, one laboratory a week. Second semester. Two lectures, one laboratory a week. Prerequisites: ENME 341, ENME 335. Chemical, heat, mechanical, nuclear and electrical energy conversion processes, cycles and systems. Reciprocating, turbo-and jet-propulsion power plants and components using all types of heat and reaction sources. Direct conversion processes of fuel cells, thermionics and magnetohydromechanics.

ENME 423 (161). ENVIRONMENTAL ENGINEERING. (3)
Three lectures a week. Prerequisites: ENME 360, 321, senior standing in mechanical engineering. Heating and cooling load computations. Thermodynamics of refrigeration systems. Low temperature refrigeration. Problems involving extremes of temperature, pressure, acceleration and radiation.

ENME 424 (164). THERMODYNAMICS II. (3)
Three lectures a week. Prerequisites: ENME 341, ENME 321, senior standing. Applications to special systems, change of phase, low temperature. Statistical concepts, equilibrium, heterogenous systems.

FLUID MECHANICS

ENME 340 (102). FLUID MECHANICS I. (3)
Two lectures and one laboratory period a week. Prerequisite: ENME 216. A rational study of fluids at rest and in motion. Principles of viscous and turbulent flow in pipes, nozzles, etc. Impulse and momentum. Pumps, turbines and meters. Dimensional analysis and laws of similarity.

ENME 341 (104). GAS DYNAMICS. (3)
Two lectures and one laboratory period a week. Prerequisite: ENME 340. Compressible flow in ducts and nozzles, effect of area change, heat addition, friction, and normal shocks. Thermodynamics of chemically reacting flows, combustion and equilibrium.

ENME 442 (163). FLUID MECHANICS II. (3)
Three lectures a week. Prerequisites: ENME 341, ENME 335, senior standing. Hydrodynamics with engineering applications. Stream function and velocity potential, conformal transformations, pressure distributions, circulation, numerical methods and analogies.

ENME 450 (180). MECHANICAL ENGINEERING ANALYSIS FOR THE OCEANIC ENVIRONMENT. (3)
Study of the characteristics of the marine environment which affect the design, operation and maintenance of mechanical equipment, effects of waves, currents, pressure, temperature, corrosion, and fouling. Study of design parameters for existing and proposed mechanical systems used in marine construction, on shipboard, in search and salvage operations.

ENME 451 (181). MECHANICAL ENGINEERING SYSTEMS FOR UNDERWATER OPERATIONS. (3)
Prerequisite: ENME 450 or consent of instructor. Study of propulsion, control and environmental systems for submerged vehicles. Design of mechanical systems in support of diving and saturated living operations.

SOLID MECHANICS

ENME 360 (101). DYNAMICS OF MACHINERY. (2)
One lecture and one laboratory period a week. Prerequisites: ENES 221, ENME 380 concurrently. Dynamic characteristics of machinery with emphasis on systems with single and multiple degree of freedom.

ENME 460 (153). ELASTICITY AND PLASTICITY I. (3)
Three lectures a week. Prerequisite: ENME 400. Analysis of plates and shells, thick walled cylinders, columns, torsion of non-circular sections, and rotating disks.

ENME 461 (162). DYNAMICS II. (3)
Three lectures a week. Prerequisites: ENME 360, ENME 380, senior standing in mechanical engineering. Linear and non-linear plane and three-dimensional motion, moving axes, LaGrange's equation, Hamilton's principle, nonlinear vibration, gyroscope, celestial mechanics.

ENME 462 (190). INTRODUCTION TO ENGINEERING ACOUSTICS. (3)
Three lectures per week. Prerequlsite: ENME 380 or equivalent. Study of the physical behavior of sound waves. Introduction to terminology and instrumentation used in acoustics. Criteria for noise and vibration control. Some fundamentals underlying noise control and applications to ventilation systems, machine and shop quieting, office buildings, jet noise, transportation systems and underwater sound.

ENGINEERING MATH, EXPERIMENTATION, ETC.

ENME 380 (116). APPLIED MATHEMATICS IN ENGINEERING. (3)
Prerequisite: MATH 240. Mathematical techniques applied to the analyses and solution of engineering problems. Use of differentiation, integration, differential equations, partial differential equations and integral transforms. Application of infiite series, numerical and statistical methods.

ENME 381 (120). MEASUREMENTS LABORATORY. (2)
One lecture and one laboratory period a week. Prerequisites: ENME 360 and ENEE 300, ENME 340 concurrently. Required of juniors in mechanical engineering. Measurements and measurement systems, application of selected instruments with emphasis on interpretation of results.

ENME 382 (140). ENGINEERING ANALYSIS AND COMPUTER PROGRAMMING. (3)
Three lectures a week. Prerequisite: ENME 380. Elements of operational calculus, vector analysis, numerical methods and programming for computers. Errors, interpolation series, integration, interaction and solution of equations.

ENME 480 (154). ENGINEERING EXPERIMENTATION. (2)
ENME 481 (155). ENGINEERING EXPERIMENTATION. (2)
One lecture and one laboratory period a week. Prerequisite: senior standing in mechanical engineering. Theory of experimentation. Selected experiments emphasize planned procedure, analysis and communications of results, analogous systems and leadership.
ENME 488 (166). SPECIAL PROBLEMS. (3)
Three lectures a week. Prerequisite: senior standing in mechanical engineering. Advanced problems in mechanical engineering with special emphasis on mathematical and experimental methods.

FOR GRADUATES

See *Graduate School Catalog* for descriptions.

DESIGN AND SYSTEM ANALYSIS

ENME 600 (206). ADVANCED MECHANICAL ENGINEERING DESIGN. (3)
ENME 601 (207). ADVANCED MECHANICAL ENGINEERING DESIGN. (3)
ENME 602 (212). CONTROL SYSTEMS ANALYSIS AND SYNTHESIS. (3)
ENME 603 (213). NONLINEAR AND ADAPTIVE CONTROL SYSTEMS. (3)

ENERGY

ENME 620 (204.) ADVANCED THERMODYNAMICS. (3)
ENME 621 (205). ADVANCED THERMODYNAMICS. (3)
ENME 622 (216). ENERGY CONVERSION-SOLID STATE. (3)
ENME 623 (217). ENERGY CONVERSION-SOLID STATE. (3)
ENME 624 (218). ENERGY CONVERSION-PLASMA STATE. (3)
ENME 625 (219). ENERGY CONVERSION-PLASMA STATE. (3)
ENME 626 (231). ADVANCED HEAT TRANSFER. (3)
ENME 627 (232). ADVANCED HEAT TRANSFER. (3)
ENME 630 (229). JET PROPULSION. (3)
ENME 631 (230). JET PROPULSION. (3)

FLUID MECHANICS

ENME 640 (210). ADVANCED FLUID MECHANICS. (3)
ENME 641 (211). ADVANCED FLUID MECHANICS. (3)
ENME 642 (233). COMPRESSIBLE FLOW. (3)
ENME 643 (234). COMPRESSIBLE FLOW. (3)
ENME 644 (280). VISCOUS FLOW. (3)
ENME 645 (281). VISCOUS FLOW. (3)
ENME 646 (282). SPECIAL TOPICS IN UNSTEADY HYDRODYNAMICS. (3)
ENME 647 (283). SPECIAL TOPICS IN UNSTEADY HYDRODYNAMICS. (3)
ENME 650 (208). DESIGN OF TURBOMACHINERY. (3)
ENME 651 (209). DESIGN OF TURBOMACHINERY. (3)

SOLID MECHANICS

ENME 660 (200). INTERMEDIATE DYNAMICS. (3)
ENME 661 (201). ADVANCED DYNAMICS. (3)
ENME 662 (221). LINEAR VIBRATIONS. (3)
ENME 663 (222). NON-LINEAR VIBRATIONS. (3)
ENME 666 (214). STRESS WAVES IN CONTINUOUS MEDIA. (3)
ENME 667 (215). STRESS WAVES IN CONTINUOUS MEDIA. (3)
ENME 670 (202). CONTINUUM MECHANICS. (3)
ENME 671 (203). LINEAR THEORY OF ELASTICITY. (3)
ENME 672 (223). PLASTICITY. (3)
ENME 673 (224). PLASTICITY. (3)
ENME 674 (227). NON-LINEAR ELASTICITY. (3)
ENME 675 (228). VISCOELASTICITY. (3)
ENME 676 (235). LINEAR AND NON-LINEAR ELASTIC SHELLS. (3)
ENME 677 (236). LINEAR AND NON-LINEAR ELASTIC SHELLS. (3)
ENME 760 (274). ADVANCED STRUCTURAL DYNAMICS I. (3)
ENME 761 (275). ADVANCED STRUCTURAL DYNAMICS II. (3)

SPECIAL TOPICS AND RESEARCH

ENME 788 (220). SEMINAR. (Var.)
ENME 799 (399). THESIS RESEARCH. (Master's Level) (Var.)
ENME 808, 809 (238). ADVANCED TOPICS IN MECHANICAL ENGINEERING. (2-3)
ENME 899 (499). THESIS RESEARCH. (Doctoral Level) (Var.)

NUCLEAR ENGINEERING

Professors: Duffey, Johnson, and Silverman.
Associate Professors: Munno, and Roush.*
Assistant Professors: Almenas, Blair, and Sheaks.
Part-Time Professor: Goldman.
Lecturer: Belcher.

Nuclear engineering deals with the practical use of nuclear energy from nuclear fission, fusion and radioisotope sources. The major use of nuclear energy is in electric power generation. Other uses are in the areas of chemical processing, medicine, instrumentation, and isotope tracer analysis. The nuclear engineer is primarily concerned with the design and operation of energy conversion devices ranging from very large reactors to miniature nuclear batteries, and with the use of nuclear reactions in many environmental, biological and chemical processes. Because of the wide range of uses for nuclear systems, the nuclear engineer finds interesting and diverse career opportunities in a variety of companies and laboratories.

Programs of study in nuclear engineering at the undergraduate and graduate level are offered through the Chemical Engineering Department. Students may use nuclear engineering as a field of concentration in the Bachelor of Science in Engineering program.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

ENNU 350 (100). INTRODUCTION TO NUCLEAR TECHNOLOGY. (3)
Prerequisites: MATH 240 and PHYS 263. Engineering problems of the nuclear energy complex, including basic theory, nuclear reactor design, and isotopic and chemical separations.
ENNU 410 (101). ENVIRONMENTAL ASPECTS OF NUCLEAR ENERGY. (3)
Protection of the public and the environment from the hazards of nuclear operations. Radiation monitoring, handling and disposal of radioactive wastes. Site selection, plant design and operation as related to the environment.
ENNU 420 (102). NUCLEAR REACTOR OPERATION. (3)
Introduction to nuclear reactor operations. Outline of reactor theory. Nature and monitoring techniques of ionizing radiation, radiation safety. Reactor instrument response. Operation of the University of Maryland nuclear reactor.

*Joint appointment with Physics.

ENNU 430 (103). RADIOISOTOPE POWER SOURCES. (3)
Prerequisite: ENNU 350 or permission of instructor. Principles and theory of radioisotope power sources. Design and use of nuclear batteries and small energy conversion devices.

ENNU 440 (148). NUCLEAR TECHNOLOGY LABORATORY. (3)
One lecture and two laboratory periods a week. Prerequisites: PHYS 263, MATH 240. Techniques of detecting and making measurements of nuclear or high energy radiation. Radiation safety experiments. Both a sub-critical reactor and the swimming pool critical reactor are sources of radiation.

ENNU 450 (163). NUCLEAR REACTOR ENGINEERING I. (3)
Prerequisites: MATH 246 and PHYSICS 263 or consent of instructor. Elementary nuclear physics, reactor theory, and reactor energy transfer. Steady-state and time-dependent neutron distributions in space and energy. Conduction and convective heat transfer in nuclear reactor systems.

ENNU 455 (167). NUCLEAR REACTOR ENGINEERING II. (3)
Prerequisite: ENNU 450. General plant design considerations including radiation hazards and health physics, shielding design, nuclear power economics, radiation effects on reactor materials, and various types of nuclear reactor systems.

ENNU 480 (169). REACTOR CORE DESIGN. (3)
Prerequisite: ENNU 450 or consent of instructor. Design of nuclear reactor cores based on a sequence of standard computer codes. Thermal and epithermal cross sections, multigroup diffusion theory in one and two dimensions and fine future flux calculations using transport theory.

ENNU 609 (301). SEMINAR IN NUCLEAR ENGINEERING. (1)

ENNU 630 (320). NUCLEAR REACTOR PHYSICS I. (3)

ENNU 640 (321). NUCLEAR REACTOR PHYSICS II. (3)

ENNU 648 (314). SPECIAL PROBLEMS IN NUCLEAR ENGINEERING. (2)

ENNU 649 (313). SELECTED TOPICS IN NUCLEAR ENGINEERING. (Var.)

ENNU 655, 656 (315, 316). RADIATION ENGINEERING. (3, 3)

ENNU 667 (317). RADIATION EFFECTS LABORATORY. (3)

ENNU 671, 672 (308, 309). NUCLEAR REACTOR LABORATORY. (3, 3)

ENNU 720 (331). NEUTRAL PARTICLE TRANSPORT. (3)

ENNU 730 (333). RADIATION SHIELDING AND ENERGY DEPOSITION. (3)

ENNU 740 (337). NUCLEAR REACTOR DYNAMICS. (3)

ENNU 761 (311). NUCLEAR FUEL WASTE PROCESSING. (3)

ENNU 799 (399). THESIS RESEARCH (Master's Level) (Var.)

ENNU 840 (335). NUCLEAR REACTOR DESIGN. (3)

ENNU 860 (340). FAST REACTOR ENGINEERING. (3)

ENNU 899 (499). DISSERTATION RESEARCH. (Ph.D. Level) (Var.)

COGNATE ACTIVITIES

Departments in the College of Engineering which contribute significantly to activities in education, research and professional service include the Institute of Fluid Dynamics and Applied Mathematics, the Department of Wind Tunnel Operations and the Fire Service Extension Department. These departments work closely with academic departments of the University in areas of common interest. The scope of work in each department area is outlined briefly in paragraphs which follows.

Fellowship grants and contracts for fundamental research contribute to the overall professional-scientific activity of the staff of the College. The staff of the College of Engineering available for research studies will be glad to discuss proposed problems of importance to industry and of public interest where means can be found for the cooperative researches; such studies may be undertaken with the approval of the administration of the University.

INSTITUTE FOR FLUID DYNAMICS AND APPLIED MATHEMATICS

The Institute for Fluid Dynamics and Applied Mathematics is a center for applied interdisciplinary research in areas requiring combined efforts in physical and mathematical sciences, environmental sciences and engineering. It hosts a faculty of eminent stature to promote a variety of programs, many involving members of other departments on campus and from other institutions. Its purpose is to provide graduate training for students interested in having an opportunity to perform research in a multidisciplinary environment.

The Institute faculty conducts theoretical and experimental research in meteorology, atomic physics, molecular physics, plasma physics, atmospheric physics, fluid dynamics, statistical mechanics, theoretical biophysics and geophysics, and in all areas of applied mathematics. Applied mathematicians in the Institute are currently studying topics in numerical analysis, control theory, nonlinear processes, elasticity, asympototic expansions, approximation theory, and in application of mathematics to life sciences and environmental sciences. Individual research efforts are coordinated wherever possible to constitute broad programs in the atmospheric, environmental, space, and life sciences. Research topics are determined entirely by the interests of students and faculty. Interdepartmental programs are strongly encouraged.

Students interested in pursuing advanced study within the Institute may be admitted to the University as graduate students in any department of engineering, or in mathematics, physics, or chemistry. Those interested in meteorology may be admitted directly to the graduate program in meteorology which exists within the Institute. Further information may be obtained by writing to the Director of the Institute for Fluid Dynamics and Applied Mathematics.

WIND TUNNEL OPERATIONS

The Wind Tunnel Operations Department conducts a program of experimental research and development in cooperation with the aircraft industry, agencies of government and other industries with problems concerning aerodynamics. Testing programs cover a variety of subjects including all types of aircraft, missiles, ordnance, parachutes, radar antennas, trucks, automobiles, structures, and exterior equipment subject to high winds.

The Department has a 7.75x11-foot wind tunnel that can be operated at speeds from 0 to 240 mph. This facility has powered model drive equipment, and auxiliary vacuum and high pressure air supplies for boundary layer control studies. Supporting shops include complete woodworking, machine shop, photographic, and instrumentation facilities.

The full-time staff of the department includes engineering, computing, shop, and technical operations personnel. This staff cooperates with other faculty and students in the College of Engineering on problems of mutual interest.

FIRE SERVICE EXTENSION DEPARTMENT

The Fire Service Extension Department provides in-service training for volunteer, municipal and industrial fire fighters, officers, rescue and ambulance personnel and serves in an advisory capacity in matters of fire prevention, fire protection, fire safety regulations, and emergency care. Classes are conducted throughout Maryland by local instructors who work under the guidance of senior instructors of the department. Basic training is given in the fundamentals of firemanship. An advanced course covers the technical field of fire prevention, control and extinguishment. Specialized courses are offered for fire officers in tactics, strategy of fire suppression and in fire department administration. A training course of 42 clock hours for heavy duty rescue operations is also available. An increasingly important program is that of establishing and improving fire prevention and fire protection in Maryland industry, institutions and mercantile establishments.

Emergency care courses incorporating the latest techniques in the treatment to the sick and injured are now offerings made available through the department. Short courses in specialized subject areas, such as instructor training, hydraulics, fire pumps, aerial apparatus, and industrial fire protection are conducted at the University at different times throughout the year.

Additional information may be obtained from the Director, Fire Service Extension Department, University of Maryland, College Park, Md. 20742.

COLLEGE OF ENGINEERING

Administrative Officers

BECKMANN, Robert Bader, Dean of the College of Engineering and Professor fo Chemical Engineering
B.S. in Ch.E., University of Illinois, 1940; Ph.D., University of Wisconsin, 1944

JOHNSON, Everett Ramon, Associate Dean and Professor of Chemical Engineering
B.A., University of Iowa, 1937; M.A., Harvard University, 1940, Ph.D., University of Rochester, 1949, M.Sc. (Hon.) Stevens Institute, 1960.

WOCKENFUSS, William Arthur, Associate Dean and Associate Professor of Mechanical Engineering
B.S., University of Maryland, 1949, M.Ed., 1952; Ed.D., University of Florida, 1960.

FACULTY

ABRAMS, Marshall D., Associate Professor of Electrical Engineering
B.S., Carnegie Institute of Technology, 1962; M.S., University of Pittsburgh, 1963, Ph.D., 1966.

ABRAMS, Richard H., Jr., Research Associate, Institute for Fluid Dynamics and Applied Mathematics
B.S., M.I.T., 1959, Ph.D., University of Maryland, 1969.

ALIC, John, Instructor in Mechanical Engineering
B.M.E., Cornell University, 1964; M.S., Stanford University, 1965.

ALLEN, Redfield Wilmerton, Professor of Mechanical Engineering
B.S., University of Maryland, 1943; M.S., 1949; Ph.D., University of Minnesota, 1959.

ALLEN, Russell Bennett, Professor Emeritus of the College of Engineering and Professor of Civil Engineering
B.S., Yale University, 1923; Registered Professional Engineer.

ALMENAS, Kazys K., Assistant Professor of Chemical Engineering
B.S., University of Nebraska, 1967; Ph.D., University and Polytechnic of Warsaw (Poland), 1968.

ANAND, Davinder K., Associate Professor fo Mechanical Engineering
B.S., George Washington University, 1959; M.S., 1961; Ph.D., 1965.

ARMSTRONG, Ronald W., Professor of Mechanical Engineering
B.E.S., Johns Hopkins University, 1955; M.S., Carnegie Institute of Technology, 1957; Ph.D., 1958.

ARSENAULT, Richard J., Professor of Chemical Engineering
B.S., Michigan Tech. University, 1957; Ph.D., Northwestern University, 1962.

ASHLEY, Holt, Distinguished Professor of Aerospace Engineering
B.S., University of Chicago, 1944; S.M., Massachusetts Institute of Technology, 1948; Sc.D., Massachusetts Institute of Technology, 1951.

ASIMOW, Robert M., Professor of Mechanical Engineering
B.S., University of California, 1953; Ph.D., 1958.

AZIZ, A. Kadir, Research Professor, (P. T.), IFDAM, and Professor, University of Maryland at Baltimore Campus
B.S., Wilson Teachers College, 1952; M.S.G., Washington University, 1954; Ph.D., University of Maryland, 1958.

BABUSKA, Ivo, Research Professor, Institute for Fluid Dynamics and Applied Mathematics
Dipl. Ing. Tech. Univ., 1949; Dr. Tech. Univ., 1951; RNDr. (Ph.D), Czechoslovak Academy, 1960; Dr. Sc., Czechoslovak Academy, 1960.

BACHTLER, Joseph deRolle, Assistant Director, Fire Service Extension
B.S., University of Southern California, 1956.

BARLOW, Jewel Bradford, Assistant Professor of Aerospace Engineering
B.E., Auburn University, 1963; M.S., 1964; Ph.D., University of Toronto, 1970.

BASHAM, Ray Scott, Associate Professor of Electrical Engineering
B.S., U.S. Military Academy, 1945; M.S., University of Illinois, 1952; Ph.D., 1962.

BECKER, Roger D., Instructor in Mechanical Engineering
B.M.E., Rensselaer Polytechnic Institute, 1957; M.S., University of Maryland, 1970.

BECKMANN, Robert Bader, Dean of the College of Engineering and Professor of Chemical Engineering
B.S., in Ch.E., University of Illinois, 1940, Ph.D., University of Wisconsin, 1944

BERGER, Bruce S., Professor of Mechanical Engineering
B.S., University of Pennsylvania, 1954; M.S., 1959; Ph.D., 1962.

BHATIA, Nam P., Research Professor, (P.T.), IFDAM and Professor, University of Maryland, Baltimore Campus
B.S., Agra University, 1952; M.S., 1954, 1956; Ph.D., Technische Hochschule, 1961.

BIRKNER, Francis Bruno, Associate Professor of Civil Engineering
B.S., Newark College of Engineering, 1961; M.S., University of Florida, 1962; Ph.D., 1965.

BLAIR, Donald J., Director of Co-operative Engineering Education and Assistant Professor of Chemical Engineering
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B.E.E., College of the City of New York, 1956; M.S.E.E., Columbia University, 1959; Ph.D., Johns Hopkins University, 1962.

WEISSHAAR, Terrence A., Assistant Professor of Aerospace Engineering
B.S., Northwestern University, 1965; S.M., Massachusetts Institute of Technology, 1966; Ph.D., Stanford University, 1970.

WESKE, John Robert, Professor of Mechanical Engineering (P. T.)
Dipl. Ing., Hannover Institute of Technology, 1924; M.S., Harvard University, 1931; Sc.D., 1934; Registered Professional Engineer.

WHEATON, Fredrick W., Research Associate of Agricultural Engineering
B.S., Michigan State University, 1964; M.S., 1965; Ph.D., Iowa State University, 1968.

WHITBECK, W. Lawrence, Instructor in Mechanical Engineering
B.S., Lafayette College, 1960; M.S., University of Maryland, 1970.

WILKERSON, Thomas D., Research Professor, Institute for Fluid Dynamics and Applied Mathematics
B.S., University of Michigan, 1953; M.S., 1954; Ph.D., 1962.

WILLSON, George B., Research Associate (Visiting)
B.S.C.E., University of Wyoming, 1951; M.S.C.E., 1963.

WINDSOR, Richard Isaac, Assistant Director, Wind Tunnel Operations
B.S., University of Maryland, 1950; M.S., 1960.

WINN, Paul N., Research Professor of Agricultural Engineering
B.S., Virginia Polytechnic Institute, 1947; M.S., 1958.

WITCZAK, Matthew W., Visiting Assistant Professor of Civil Engineering
B.S., Purdue University, 1961; M.S., 1963; Ph.D., 1969.

WOCKENFUSS, William Arthur, Associate Dean and Associate Professor of Mechanical Engineering
B.S., University of Maryland, 1949; M.Ed., 1952; Ed.D., University of Florida, 1960.

WRIGHT, Charles Jensen, Senior Instructor, Fire Service Extension
B.S., University of Maryland, 1968.

WU, C. S., Research Professor, Institute for Fluid Dynamics and Applied Mathematics
B.S., National Taiwan University, 1954; M.S., Virginia Polytechnic Institute, 1956; Ph.D., Princeton, 1959.

YANG, Jackson, Associate Professor of Mechanical Engineering
B.S., University of Maryland, 1958; M.S., 1962; Ph.D., 1963.

YORKE, James A., Research Associate Professor, Institute for Fluid Dynamics and Applied Mathematics
A.B., Columbia College, 1936; Ph.D., University of Maryland, 1966.

ZAKI, Kawthar, Assistant Professor of Electrical Engineering
B.S., Ain Shams University, Cairo, 1962; M.S., University of California (Berkeley), 1966; Ph.D., 1969.

ZAJACK, III, Felix B., Assistant Professor of Electrical Engineering
B.S., Rensselar Polytechnic Institute, 1962; M.S., Stanford University, 1965; Ph.D., 1968.

ZWALLY, H. Jay, Visiting Research Assistant Professor, Institute for Fluid Dynamics and Applied Mathematics
B.S., Drexel Institute, 1961; Ph.D., University of Maryland, 1968.

ZWANZIG, Robert W., Research Professor, Institute for Fluid Dynamics and Applied Mathematics
B.S., Polytechnic Institute of Brooklyn, 1948; M.S., University of Southern California, 1950; Ph.D., California Institute of Technology, 1952.

Lecturers and Educational Advisors

ANDERSON, John David, Lecturer of Aerospace Engineering
B.S., University of Florida, 1959; Ph.D., Ohio State University, 1966.

BELCHER, Ralph L., Lecturer in Chemical Engineering
B.S., Marshall College, 1941; M.S., University of Kentucky, 1947; Ph.D., University of Maryland, 1966.

BILLIG, Frederick S., Lecturer in Aerospace Engineering
B.S., Johns Hopkins University, 1955; M.S., University of Maryland, 1958; Ph.D., University of Maryland, 1964.

BONNER, William D., Lecturer, Institute for Fluid Dynamics and Applied Mathematics
B.A., University of Chicago, 1952; B.S., Pennsylvania State, 1954; M.S., University of Chicago, 1960; Ph.D., 1965.

BRANDT, Alan, Lecturer in Aerospace Engineering
B.C.E., Cooper Union University, 1961; M.S.C.E., Carnegie Mellon University, 1963; Ph.D., Carnegie Mellon University, 1966.

BULLIS, William Murray, Lecturer in Electrical Engineering
B.A., (Physics), Miami University, (Ohio), 1951; Ph.D., (Physics), Massachusetts Institute of Technology, 1956.

BYINGTON Stanley Ross, Lecturer in Civil Engineering
B.S.C.E., Norwich University, 1956; M.S.C.E., Texas A & M University, 1964

COLBURN, Theodore R., Lecturer in Electrical Engineering
B.S., University of Maryland, 1962; M.S., 1966; Ph.D., 1969.

DAWSON, Victor C. D., Lecturer of Mechanical Engineering
B.S., Massachusetts Institute of Technology, 1948; M.S., Harvard University, 1951; M.E., California Institute of Technology, 1959; Ph.D., University of Maryland, 1963.

DEDRICK, Robert L., Lecturer in Chemical Engineering
B.E., Yale University, 1956; M.S., University of Michigan, 1957; Ph.D., University of Maryland, 1965.

DEGENFORD, James Edward, Lecturer in Electrical Engineering
B.S., University of Illinois, 1960; M.S., 1961; Ph.D., 1964.

FLEIG, Albert J., Lecturer in Aerospace Engineering
B.S.E.S., Purdue University, 1958; Ph.D., Catholic University of America, 1968.

FORDHAM, David G., Jr., Lecturer in Electrical Engineering
B.S., Georgia Institute of Technology, 1966.

GERRITY, Joseph P., Lecturer, Institute for Fluid Dynamics and Applied Mathematics
B.A., Manhattan College, 1952; M.S., New York University, 1959; Ph.D., 1966.

MORAKIS, James C., Lecturer in Electrical Engineering
B.S., City College of New York, 1953; M.S., Columbia University, 1954; Ph.D., University of Maryland, 1967.

OHMAN, Gunnar Peter, Lecturer in Electrical Engineering
B.S.E.E., Illinois Institute of Technology, 1943; M.S., University of Maryland, 1948; Ph.D., 1959.

PRICE, Henry William, Jr., Lecturer in Electrical Engineering
B.S., University of Maryland, 1943; M.S., 1950.

RAJAN, Jai Rj Narain, Lecturer in Civil Engineering
B.S., Lucknow University, 1953; M.S., Duke University, 1962; Ph.D., 1966.

ROBERTS, Richard Calvin, Lecturer in Civil Engineering
A.B., Kenyon College, 1946; Sc.M., Brown University, 1946; Ph.D., 1949.

SCHUCHARD, Earl Adolph, Lecturer in Electrical Engineering
B.S. (Physics), University of Washington, 1933; M.S. (Physics), 1934; Ph.D. (Physics), 1940.

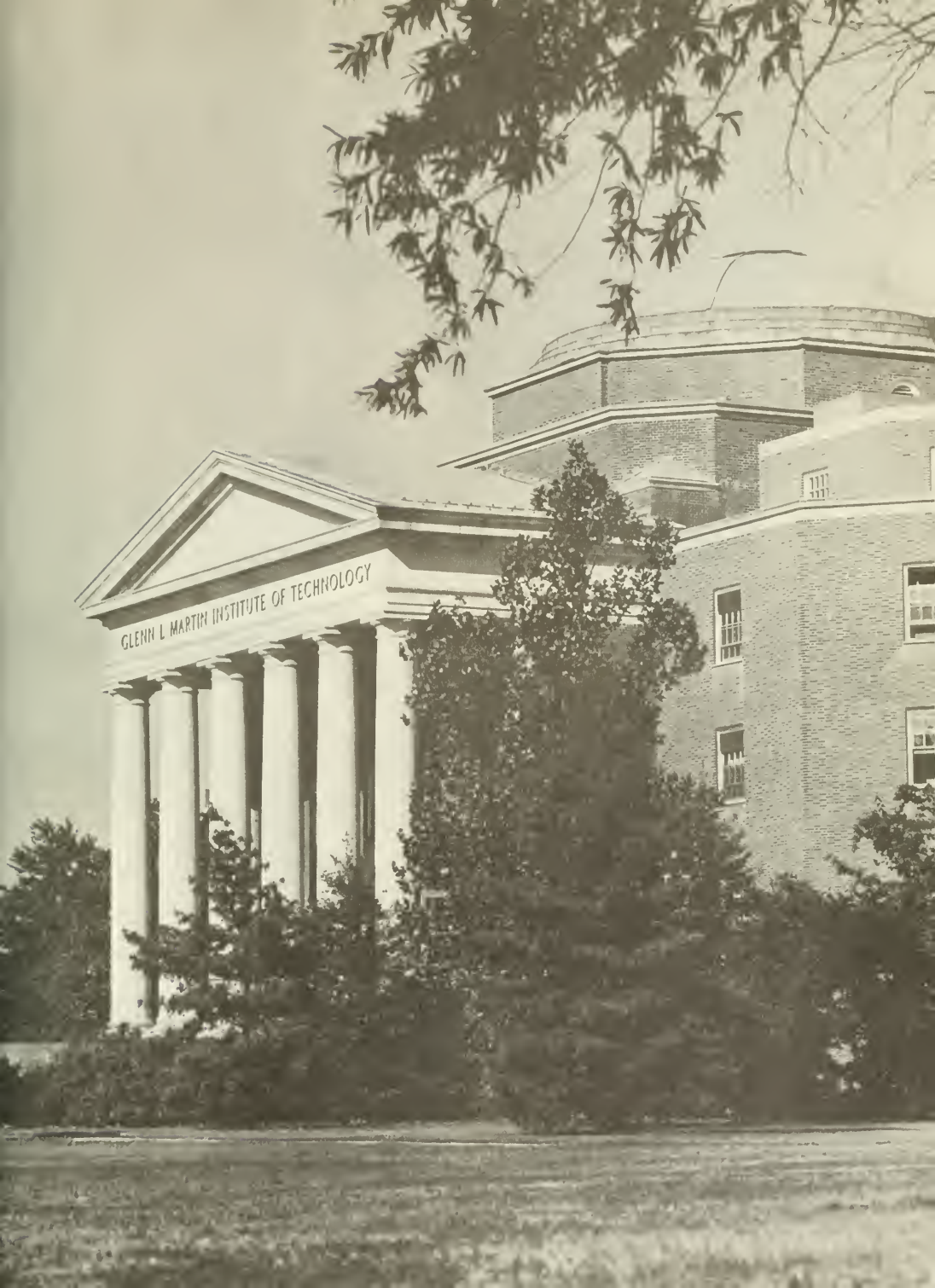
SCHULMAN, Joseph Robert, Lecturer in Electrical Engineering
B.E.E., City College of New York, 1944; M.S., University of Maryland, 1951.

SEIGEL, Arnold E., Lecturer in Mechanical Engineering
B.S., University of Maryland, 1944; M.S., Massachusetts Institute of Technology, 1947; Ph.D., University of Amsterdam (Holland), 1952.

WALKER, Stanton, Lecturer in Civil Engineering
B.S., University of Illinois, 1917; Registered Professional Engineer. Honorary Doctorate Degree, University of Maryland, 1962.

WHICKER, Lawrence Rhea, Lecturer in Electrical Engineering
B.S., University of Tennessee, 1957; M.S., 1958; Ph.D., Purdue University, 1964.

WILSON, Robert Elmer, Lecturer in Aerospace Engineering
B.S., Georgia Institute of Technology, 1941; M.S., 1942; Ph.D., University of Texas, 1952.


GLENN L MARTIN INSTITUTE OF TECHNOLOGY

Home Economics

THE COLLEGE OF HOME ECONOMICS serves Maryland and surrounding areas with its program for the education of young men and women interested in the social, economic, scientific, and aesthetic aspects of family living and the community. The educational offerings of the colleg are planned to help students function effectively and creatively as individuals, as family members and as responsible citizens; to prepare them for positions for which home economics is a major or minor preparation; and to promote an appreciation for and utilization of the findings of research.

The over-all function of home economics is to intergrate the contributions of the physical and biological sciences, the social sciences, psychology, philosophy, and art in the treatment of all phases of individual and family life, to the end that they are used by families and individuals in all parts of society and by the agencies serving them.

The College of Home Economics is organized into the Departments of Family and Community Development; Food, Nutrition and Institution Administration; Housing and Applied Design; and Textiles and Consumer Economics.

SPECIAL FACILITIES AND ACTIVITIES

PHYSICAL FACILITIES

The College of Home Economics building follows the campus tradition in style, and a construction program has been initiated to provide expanded facilities. A management center is maintained on the campus for resident experiences in management activities of family life.

Located between two large cities, the college provides unusual opportunities for both faculty and students. In addition to the University's general and specialized libraries, Baltimore and Washington furnish added library facilities. The art galleries and museums, the government bureaus and city institutions stimulate study and provide enriching experiences for home economics students.

SOCIETIES

HOME ECONOMICS CHAPTERS

Membership is open to all home economics students. The club is affiliated with the Maryland and American Home Economics Associations.

OMICRON NU

National home economics honor society. Senior and second-semester junior students of high scholarship are eligible for election to membership.

A.I.D.—STUDENT CHAPTER

American Institute of Interior Designers.

N.S.I.D.—STUDENT CHAPTER

A student chapter affiliated with the National Society of Interior Designers.

STUDENT SENATE

This elected, advisory group of students promotes the interests of the College of Home Economics. Student representatives to the College Assembly, College Council and Standing Committees of the College Assembly are named from this group.

LOAN FUND

A LOAN FUND, composed of contributions by the District of Columbia Home Economics Association, Maryland Chapter of Omicron Nu, and personal gifts, is available through the University Office of Student Aid.

ADMISSION

All students desiring to enroll in the College of Home Economics must apply to the director of admissions of the University of Maryland at College Park.

DEGREES

The degree of Bachelor of Science is conferred for the satisfactory completion, with an average of "C" or better, of a prescribed curriculum of 120 academic semester hour credits. This is exclusive of health and physical activities for women and men. No grade below a "C" is acceptable in the departmental courses which are required for a departmental major.

The Master of Science degree is offered in food, nutrition and institution administration; in textiles and consumer economics; in related areas of home economics in the College of Home Economics; and also in home economics education in the College of Education.

STUDENT LOAD

The student load in the College of Home Economics varies from 15-19 credits. A student wishing to carry more than 19 credits must have a "B" grade average and permission of the dean.

A minimum of 120 academic credits is required for graduation. However, for certification in some professional organizations additional credits are required. Consult your advisor.

CURRICULA

A student may elect one of the following curricula, or a combination of curricula: food, nutrition, dietetics, or institution administration (food service); family, community, or management and consumer studies; home economics education; housing, advertising design, interior design, design, or crafts; textile science, textile marketing, textiles and apparel or consumer economics. A student who wishes to teach home economics may register in home economics education in the College of Home Economics under the Department of Family and Community Development or in the College of Education.

GENERAL INFORMATION

Specific inquiries concerning undergraduate or graduate programs in the College of Home Economics may be directed to the chairmen of the various departments or the Dean, College of Home Economics, University of Maryland, College Park, Maryland 20742.

REQUIRED COURSES

The curricula leading to a major in the College of Home Economics are organized into four broad professional categories: (1) technical areas, (2) educational, community and family life areas, (3) consumer service areas, and (4) design areas. These represent the broad professional fields into which graduates are eligible to enter and pursue their chosen work. The positions vary in nature, scope and title, but require similar general studies background and fundamentals for specialization.

Individual programs of study are developed cooperatively with faculty advisors to provide a balanced and sequential arrangement of studies in preparation for the chosen field. University, college, and departmental requirements are identified for curricula in each of the departments.

All students in the College of Home Economics are required to complete a series or sequence of courses to satisfy University, college and departmental requirements. The remaining courses needed to complete a program of study are elected by the student with the approval of his advisor.

The final responsibility of meeting all the requirements for a specific major rests with each individual student.

UNIVERSITY REQUIREMENTS

(General Education—Academic)

	Semester Credit Hours
ENGL COMP 101 or ENGL HONORS COMP 171	3
ENGL 201, 202, 211, 212, 221, 222, 241, 242, 243, 292	6
Fine Arts or Philosophy (choice of one)	3
DANC 200, 482 or 483, 484 ARTH 100, 260, 261, 284, 320, 321, 330, 331, 340, 341 MUSC 130 DART 110, 170 PHIL 100, 170, 140, 233, 236, 250, 330, 457, 444	
History (any combination of History courses for which the student is eligible except State History)	6
Mathematics (any credit bearing course) SAT score determines qualification	3-4
Natural Science (choice of two courses) If the science requirements are not specified in departmental majors, one course must be a physical science and the other a biological science. One of them must be a laboratory (four hour) course.	7
Social Science (choice of two courses) SOCY 100, ANTH 101, ECON 205 or 201, GVPT 170, GVPT 100 or 300, PSYC 100 (001), GEOG 100 (001), GNED 260 (060), RATV 124 (024)	6
Total	34-35

(Non-Academic)

For men and women. HLTH 105	2
Physical Education—two semesters	2
Total	4

COLLEGE OF HOME ECONOMICS REQUIREMENTS

(For every student)

APDS 101—Fundamentals of Design	3
TEXT 105—Textiles in Contemporary Living	3
FOOD 110—Food and Nutrition of Individuals and Families or NUTR 100—Elements of Nutrition	3
FMCD 250—Decision Making in Family Living	3

Root Discipline Requirements Outside the College

SOCY 100—Sociology of American Life [1]	3
PSYC 100—Introduction to Psychology [1]	3
ECON 205—Fundamentals of Economics [1]	3
SPCH 107 or 100—Public Speaking	2-3

Typical Freshman Year (15 to 18 hours each semester)

	Semester Hours
ENGL 101, 201—Composition and Literature	6
Mathematics	0-3
FMCD 105—Introduction to Family Living [2]	3
APDS 101—Fundamentals of Design	3
SPCH 107 or 100—Public Speaking	2-3
SOCY 100—Sociology of American Life	3
FOOD 110—Food and Nutrition of Individuals and Families	3
TEXT 105—Textiles and Clothing in Contemporary Living	3
Physical or Biological Science	3-6
HLTH 105	2
Physical Education	2
Electives	4

[1]Any two of these automatically satisfy the six-hour social science requirement of General Education.
[2]Required for home economics education and family and community development majors.

DEPARTMENT OF FOOD, NUTRITION AND INSTITUTION ADMINISTRATION

The area of food, nutrition and institution administration is broad and offers many diverse professional opportunities. Courses introduce the student to the principles of selection, preparation and utilization of food for human health and the welfare of society. Emphasis is placed on the scientific, cultural and professional aspects of this broad area of food and nutrition. The department offers four areas of emphasis: experimental foods, nutrition, dietetics, and institution administration. Each program provides for competencies in several areas of work; however, each option is designed specifically for certain professional careers.

All areas of emphasis have in common several courses within the department and the University; the curricula are identical in the freshman and sophomore years.

Experimental foods is designed to develop competency in the scientific principles of food and their reactions. Physical and biological sciences in relation to foods are emphasized. The program is planned for students who are interested in product development, quality control and technical research in foods. The nutrition program is designed to develop competency in the area of nutrition for students who wish to emphasize physical and biological sciences. Dietetics develops an understanding and competency in food, nutrition and management as related to problems of dietary departments. The curriculum includes courses necessary to meet the academic requirements for American Dietetic Association internship and membership. Institution administration emphasis is related to the administration of quantity food service in university and college residence halls and student unions, school lunch programs in elementary and secondary schools, restaurants, coffee shops, and industrial cafeterias. The curriculum meets academic requirements for approved college, industry or business internship and membership in the American Dietetic Association.

FRESHMAN AND SOPHOMORE CURRICULUM

Freshman Year	Semester I	Semester II
ENGL 101, 201—Composition and World Literature	3	3
MATH 110 or 115	3	..
APDS 101 or 104—Fundamentals or History of Design	..	3
SPCH 107—Public Speaking	2	..
FOOD 110—Food and Nutrition of Individuals and Families	3	..
TEXT 105—Textiles and Clothing in Contemporary Living	..	3
CHEM 103, 104—College Chemistry I, II	4	4
HLTH 105—Science and Theory of Health	..	2
Physical Education	1	1
FOOD 105—Professional Orientation	1	..
Total	17	16

Sophomore Year	Semester I	Semester II
ENGL 202—World Literature	..	3
CHEM 201, 202—College Chemistry III	5	..
ECON 205—Fundamentals of Economics	..	3
FOOD 240, 250—Science of Food Preparation	3	3
PSYC 100—Introduction of Psychology	3	..
ZOOL 101—General Zoology	4	..
MICB 200—General Microbiology	..	4
FMCD 250—Decision Making in Family Living	..	3
Total	15	16

EXPERIMENTAL FOODS EMPHASIS

Junior Year	Semester I	Semester II
HIST—History Requirement	3	3
SOCY 100—Introduction to Sociology	3	..
Fine Arts or Philosophy requirement	3	..
NUTR 300—Science of Nutrition	..	3
FOOD 440, 450—Advanced and Experimental Food Science	3	3
CHEM 461, 462—Biochemistry	3	3
FDSC 412—Principles of Food Processing	..	3
Total	15	15
Senior Year		
PHYS 111—Elements of Physics	3	..
FDSC 432—Analytical Quality Control	..	3
FDSC 422—Food Product Research and Development	..	3
Electives [3]	12	9
Total	15	15

[3]Nine hours of the 21 electives must be selected from the following list:

AGRI 401—Agricultural Biometrics (3) or FDSC 431—Statistical Quality Control (3)
CHEM 219—Elements of Quantitative Analysis (3)
NUTR 450—Advanced Nutrition (3)
FOOD 490—Special Problems in Foods (3)
FOOD 260—Meal Management (3)
FOOD 300—Economics of Food Consumption (3)
MICB 290—Applied Microbiology (4)
IADM 420—Quantity Food Purchasing (3)
IADM 430—Quantity Food Production (3)
FMCD 370—Communication Skills and Techniques in Home Economics (3)
AGEN 313—Mechanics of Food Processing (4)

NUTRITION EMPHASIS

Junior Year	Semester I	Semester II
History Requirement	3	3
SOCY 100—Introduction to Sociology	3	..
Fine Arts or Phliosophy requirement	..	3
FOOD 260—Meal Management	3	..
CHEM 461, 462—Biochemistry	3	3
ZOOL 201, 202—Human Anatomy and Physiology	4	4
NUTR 300—Science of Nutrition	..	3
Total	16	16
Senior Year		
NUTR 450, 460—Advanced and Therapeutic Nutrition	3	3
NUTR 490—Special Problems in Nutrition	..	3
Electives [4]	11	8
Total	14	14

[4]Nine hours of the 19 electives must be selected from the following list:

AGRI 401—Agricultural Biometrics (3)
EDHD 460—Educational Psychology (3)
CHEM 219—Elements of Quantitative Analysis (4)
CHEM 463—Biochemistry Lab. (2)
CHEM 464—Biochemistry Lab. (2)
NUTR 415—Maternal, Infant and Child Nutrition (2)
NUTR 425—International Nutrition (2)
NUTR 435—History of Nutrition (2)
FOOD 300—Economics of Food Consumption (3)
FMCD 370—Communication Skills and Techniques in Home Economics (3)

INSTITUTION ADMINISTRATION EMPHASIS

Junior Year	Semester I	Semester II
History Requirement	..	3
SOCY 100—Introduction to Sociology	3	..
NUTR 300—Science of Nutrition	..	3
IADM 300—Food Service Organization and Management	3	..
IADM 430—Quantity Food Production	3	..
ZOOL 201, 202—Anatomy and Physiology [5]	4	4
BSAD 220—Accounting	3	..
BSAD 221—Accounting	..	3
Electives	..	3
Total	16	16

[5]Students not planning to meet academic requirements for ADA may substitute approved additional courses in business administration or the social sciences.

Senior Year		
IADM 420—Quantity Food Purchasing		3
IADM 440—Food Service Personnel Administration		2
IADM 450—Food Service Equipment and Planning	2	..
BSAD 380 or ECON 470—Business Law or Labor Economics	3	..
IADM 490 or 350—Special Problems or Practicum in Institution Administration	..	3
History Requirement	3	..
Fine Arts or Philosophy requirement	3	..
Electives	3	6
Total	14	14

DIETETIC EMPHASIS

Junior Year	Semester I	Semester II
NUTR 300—Science of Nutrition	..	3
CHEM 461, 462—Biochemistry	3	3
ZOOL 201, 202—Anatomy and Physiology	4	4
FOOD 260—Meal Management	..	3
History Requirement	3	3
IADM 300—Food Service Organization and Management	3	..
IADM 430—Quantity Food Production	3	..
Total	16	16
Senior Year		
NUTR 450, 460—Advanced and Therapeutic Nutrition	3	3
IADM 420—Quantity Food Purchasing	..	3
IADM 440—Food Service Personnel Administration	..	2
IADM 450—Food Service Equipment and Planning	2	..
EDHD 460—Educational Psychology	3	..
Fine Arts or Philosophy requirement	3	..
SOCY 100—Introduction to Sociology	..	3
Electives	3	3
Total	14	14

FOOD, NUTRITION AND INSTITUTION ADMINISTRATION

Professor and Chairman: Prather.
Associate Professors: Ahrens and Butler.
Visiting Associate Professor: Hopkins.
Assistant Professors: Eheart, Wang and Zallen.
Visiting Assistant Professor: Berdanier.
Instructors: Knighton, Niffenegger.
Lecturers: Boehne, Sagar and Palumbo.

FOOD 105 (FDNT 050). PROFESSIONAL ORIENTATION. (1)
Second semester. A series of lectures introducing the student to the broad field of careers in food, nutrition, dietetics, and institution administration. Includes trends, role of related sciences, educational and personal requirements, ethics, and opportunities in each professional area.

FOOD 110 (FDNT 005). FOOD AND NUTRITION OF INDIVIDUALS AND FAMILIES. (3)
Two lectures and one two-hour laboratory period a week. A study of food in contemporary living. The economic, social and esthetic implications of food as well as its nutritive value. Selection and use of food in relation to eating habits, health and well-being of the individual. Survey of meal preparation and service applied to family situations.

FOOD 200 (010). SCIENTIFIC PRINCIPLES OF FOOD. (3)
Two lectures and one two-hour laboratory period a week. Prerequisites: FOOD 110 or NUTR 100, and CHEM 103 or concurrent registration. Study of basic scientific principles as applied to food preparation processes. For nondepartmental majors.

FOOD 240, 250 (052, 053). SCIENCE OF FOOD PREPARATION. (3, 3)
One lecture and two two-hour laboratory periods a week. Prerequisites: FOOD 110, CHEM 104 or concurrent registration. Composition and structure of food with study

of the fundamental principles involved in food preparation. Especially designed for departmental majors.

FOOD 260 (060). MEAL MANAGEMENT. (3)
Two lectures and one three-hour laboratory a week. Prerequisites: FOOD 200 or 240. Retail selection of food commodities in relation to levels of spending; management of family meals through organization of available resources.

FOOD 300 (170). ECONOMICS OF FOOD CONSUMPTION. (3)
Prerequisites: Economics and consent of the instructor: Interrelations of food, population and economic progress; trends in food-consumption patterns; world and local food problems.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

FOOD 440 (152). ADVANCED FOOD SCIENCE. (3)
First semester. Three lectures per week. Prerequisites: FOOD 240, 250, CHEM 461 or concurrent registration. Chemical and physical properties of food as related to consumer use in the home and institutions.

FOOD 450 (153). EXPERIMENTAL FOOD SCIENCE. (3)
Second semester. One lecture, two laboratories per week. Prerequisite: FOOD 440 or equivalent. Individual and group laboratory experimentation as an introduction to methods of food research.

FOOD 480 (180). FOOD ADDITIVES. (3)
Alternate years. Prerequisite: FOOD 440 or equivalent. Effects of intentional and incidental additives on food quality, nutritive value and safety. FDA approved additives, GRAS substances, pesticide residues, mycotoxins, antibiotics, and hormones will be reviewed.

FOOD 490 (130). SPECIAL PROBLEMS IN FOODS. (2-3)
First or second semester. Prerequisite: FOOD 440 and consent of instructor. Individual selected problems in the area of food science.

FOR GRADUATES

See the *Graduate School Catalog* for descriptions.

FOOD 610 (210). READINGS IN FOOD. (3)
FOOD 620 (204). NUTRITIONAL AND QUALITY EVALUATION OF FOOD. (3)
FOOD 640 (240). FOOD ENZYMES. (3)
FOOD 650 (200). ADVANCED EXPERIMENTAL FOOD. (3-5)
FOOD 678 (HOEC 290E). SPECIAL TOPICS IN FOODS. (1-6)
FOOD 688 (220). SEMINAR. (1-2)
FOOD 799 (399). RESEARCH. (1-6)

NUTRITION

NUTR 100 (020). ELEMENTS OF NUTRITION. (3)
Three lectures per week. Fundamentals of human nutrition. Nutrient requirements related to changing individual and family needs. For nondepartmental majors.

NUTR 200 (080). NUTRITION FOR HEALTH SERVICES. (3)
Prerequisites: CHEM 103, ZOOL 101. Two lectures and one two-hour laboratory. A study of nutritional status and the effect of food habits and food consumption on family health. Nutritional requirements for individuals in different stages of development. Techniques and procedures for the application of nutrition knowledge with consideration of various economic levels and social backgrounds.

NUTR 300 (121). SCIENCE OF NUTRITION. (3)
Second semester. Prerequisites: ZOOL 101, CHEM 201, 202 or concurrent registration. Two lectures and one two-hour laboratory. An understanding of the chemical and physiological utilization of nutrients present in food as related to individual human nutrition status; includes digestion and absorption, requirements, deficiencies.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

NUTR 415 (140). MATERNAL, INFANT AND CHILD NUTRITION. (2)
Two lectures per week. Prerequisite: course in basic nutrition. Nutritional needs of the mother, infant and child and the relation of nutrition to physical and mental growth.

NUTR 425 (145). INTERNATIONAL NUTRITION. (2)
Two lectures per week. Prerequisite: course in basic nutrition. Nutritional status of world population and local, national and international programs for improvement.

NUTR 435 (150). HISTORY OF NUTRITION. (2)
Two lectures per week. Prerequisite: course in basic nutrition. A study of the development of the knowledge of nutrition and its interrelationship with social and economic developments.

NUTR 450 (124). ADVANCED NUTRITION. (3)
First semester. Prerequisites: consent of department; ZOOL 101; CHEM 461, 462 or concurrent registration. Two lectures and one two-hour laboratory. The progress of nutrition as found in the results of current research, with emphasis on interpretation and application.

NUTR 460 (125). THERAPEUTIC NUTRITION. (3)
Second semester. Two lectures and one laboratory period a week. Prerequisites: NUTR 300, 450. Modifications of the normal adequate diet to meet human nutritional needs in pathological conditions.

NUTR 490 (130). SPECIAL PROBLEMS IN NUTRITION. (2-3)
First or second semester. Prerequisites: NUTR 300 and consent of instructor. Individual selected problems in the area of human nutrition.

FOR GRADUATES

See the *Graduate School Catalog* for descriptions.

NUTR 600 (208). RECENT PROGRESS IN HUMAN NUTRITION. (3)
NUTR 610 (210). READINGS IN NUTRITION. (3)
NUTR 620 (212). NUTRITION FOR COMMUNITY SERVICES. (3)
NUTR 670 (221). INTERMEDIARY METABOLISM IN NUTRITION. (3)
NUTR 678 (HOEC 290G). SPECIAL TOPICS IN NUTRITION. (1-6)
NUTR 680 (285). HUMAN NUTRITIONAL STATUS. (3)
NUTR 688 (220). SEMINAR. (1-2)
NUTR 699 (211). PROBLEMS IN NUTRITION. (3-5)
NUTR 799 (399). RESEARCH. (1-6)

INSTITUTION ADMINISTRATION

IADM 300 (150). FOOD SERVICE ORGANIZATION AND MANAGEMENT. (3)
First semester. Introduction to the food services, principles of organization, management, financial control, and technical operations. Records, reports and organization charts included.

IADM 350 (140). PRACTICUM IN INSTITUTION ADMINISTRATION. (3)
Prerequisites: five credits in IADM and consent of department. In-service training and practical experience, totaling at least 240 hours, in an approved food service.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

IADM 410 (154). SCHOOL FOOD SERVICE. (3)
Two lectures and one morning a week for field experience in a school food service. Prerequisites: FOOD 200, or 240, 250, and NUTR 300, or consent of instructor. Study of organization and management, menu planning, food purchasing, preparation, service, and cost control in a school lunch program.

IADM 420 (151). QUANTITY FOOD PURCHASING. (3)
Second semester. Prerequisite: FOOD 240, introductory accounting recommended. Food selection and the development of integrated purchasing programs. Standards of quality; the marketing distribution system.

IADM 430 (152). QUANTITY FOOD PRODUCTION. (3)
First semester. Two hours of lecture and one three-hour laboratory a week. Prerequisites: FOOD 240, or consent of instructor. Scientific principles and procedures employed in food preparation in large quantity. Laboratory experience in management techniques in quantity food production and service.

IADM 440 (153). FOOD SERVICE PERSONNEL ADMINISTRATION. (2)
Second semester. Prerequisite: IADM 300. Principles of personnel administration in food services; emphasis on personnel selection; supervision and training; job evaluation, wage and payroll structure, current labor regulations, and interpersonal relationships and comunications.

IADM 450 (155). FOOD SERVICE EQUIPMENT AND PLANNING. (2)
First semester. Two lectures a week. Prerequisite: consent of instructor. Equipment design, selection, maintenance and efficient layout, relation of the physical facility to production and service.

IADM 460, 470 (181, 182). ADMINISTRATIVE DIETETICS. (3, 3)
(Open only to students accepted into and participating in the U.S. Army Dietetic Internship program at Walter Reed General Hospital.) Application of management theory through guided experience in all aspects of hospital dietary department administration.

IADM 480 (183). APPLIED DIET THERAPY. (3)
(Open only to students accepted into and participating in the U.S. Army Dietetic Internship program at Walter Reed General Hospital.) Application of principles of normal and therapeutic nutrition in the total medical care and instruction of patients.

IADM 490 (130). SPECIAL PROBLEMS IN FOOD SERVICE. (2-3)
First or second semesters. Prerequisites: senior standing and consent of instructor. Individual selected problems in the area of food service.

FOR GRADUATES
See the *Graduate School Catalog* for descriptions.

IADM 600 (200). FOOD SERVICE ADMINISTRATION. (3)

IADM 610 (210). READINGS IN FOOD ADMINISTRATION. (3)

IADM 630 (235). COMPUTER APPLICATION IN FOOD SERVICE. (3)

IADM 640 (245). SANITATION AND SAFETY IN FOOD SERVICE. (3)

IADM 650 (255). EXPERIMENTAL QUANTITY FOOD PRODUCTION. (3)

IADM 678 (HOEC 290E). SPECIAL TOPICS IN INSTITUTIONAL FOODS. (1-6)

IADM 799 (399). RESEARCH. (1-6)

DEPARTMENT OF TEXTILES AND CONSUMER ECONOMICS

Students may select one of four majors. Each offers diverse professional opportunities. Through supportive courses students add to their major studies a concentration of work in an allied area such as art, business, family services, journalism, sciences, or speech and dramatic art.

In the *textile science* major emphasis is placed on the scientific and technological aspects of the field. Graduates will be qualified for employment in many facets of the textile industry including research and testing laboratories, consumer technical service and marketing programs, and in buying and product evaluation.

In the *textiles and apparel major* emphasis is placed on the cultural, economic and professional aspects of the field. Students are prepared for careers in fashion merchandising and promotion, instruction and demonstration with business and educational organizations, fashion designing, consumer services, and technical or managerial positions with a clothing manufacturer.

Graduates of the *textile marketing* major will be qualified to function as communicators between the textile producer and consumer in merchandising and fashion promotion, in consumer education programs in business and in textile product promotion and development.

Graduates completing the major in *consumer economics* will be able to provide liaison between the consumer and producers and distributors of goods and services utilized directly by families and may work in consumer education programs, in marketing and consumer relation divisions in business and industry, or in government agencies providing consumer services.

A department Honors Program permits outstanding undergraduates to explore in depth on an individual basis a program of work which will strengthen their undergraduate program and their professional interests. Students selected for the program must have a "B" average or better to be considered. Students in the honors program participate in a junior honors seminar and present a senior thesis.

Freshman Year (Common To All Majors)

English 101 and 201	3	3
Math 105, 110 and 115	3-4	..
APDS 101	3	..
Speech 107 or 100	..	2-3
FOOD 110	..	3
Textiles in Contemporary Living (TEXT 105)	3	..
Physical Science (CHEM 103, 104 or 105, 106)	4	4
Health 105	..	2
Physical Education	1	1
	17-18	15-16

TEXTILES AND APPAREL

		Semester Hours
Sophomore Year		
English 202	3	..
Economics 201 and 203	3	3
Psychology 100	..	3
FMCD 250	3	..
Apparel I & II TXAP 221 & 222	3	3
Introduction to Textile Materials TEXT 150	3	..
Textile Materials: Evaluation and Characterization TEXT 250	..	3
Elective	..	3
	15	15
Junior Year		
Sociology 100		3
Apparel Design: Draping TXAP 420 or Apparel Design: Experimental Processes TXAP 425	..	3
Textile Science: Chemical Structure and Properties of Fibers TEXT 452 or Environmental Textiles TEXT 355		3
History		3
Fine Arts Requirement		3
Marketing BSAD 350		3
Home Economics Electives		6
Electives		6
		30

Senior Year	
Clothing and Human Behavior TXAP 441 or Consumer Behavior CNEC 437	3
Economics of the Textile and Apparel Industries TEXT 465 or Economics of Consumption CNEC 435	3
History	3
Home Economics Elective	3
Electives	18-20
	30-32

TEXTILE MARKETING

	Semester Hours	
Sophomore Year		
English 202	3	..
Economics 201 and 203	3	3
Psychology 100	..	3
FMCD 250	3	..
TXAP 221 and 222 or Home Economics Electives	3	3
Introduction to Textile Materials TEXT 150	3	..
Textile Materials: Evaluation and Characterization TEXT 250	..	3
Elective	..	3
	15	15
Junior Year		
Sociology 100	..	3
Textile Science: Chemical Structure and Properties of Fibers TEXT 452 or Environmental Textiles TEXT 355	..	3
Fine Arts Requirement	..	3
History	..	6
Marketing BSAD 350	..	3
Journalism 341, 330, 371, 331 (or alternative)	..	3
RATV 315 (or alternative)	..	3
Electives	..	6
		30
Senior Year		
Clothing and Human Behavior TXAP 441 or Consumer Behavior CNEC 437	..	3
Economics of the Textile and Apparel Industries TEXT 465	..	3
Statistics BSAD 230	..	3
BSAD 352, 450 or 452	..	3
Electives	..	18-21
		30-33

TEXTILE SCIENCE

	Semester Hours	
Sophomore Year		
English 202	3	..
FMCD 250	..	3
Psychology 100	..	3
Introduction to Textiles TEXT 150	3	..
Textile Materials: Evaluation and Characterization TEXT 250	..	3
Chemistry 201, 202, 203, 204 or 211, 212, 213, 214	5	5
Math 140, 141 or 110, 111	3-4	3-4
	14-15	17-18
Junior Year		
Fine Arts Requirement	..	3
Physics 121, 122 or 161, 262	..	7-8
Textile Science: Chemical Structure and Properties of Fibers TEXT 452	..	3
Sociology 100	..	3
Statistics	..	3
Economics 201 and 203	..	6
Electives	..	6
		31-32

Senior Year	
Textile Science: Finishes TEXT 454 or Textile Science: Chemistry and Physics of Fibers and Polymers TEXT 456	3
Economics of the Textile and Apparel Industries TEXT 465 or Economics of Consumption CNEC 435	3
History	6
Electives	15-18
	27-30

CONSUMER ECONOMICS

	Semester Hours	
Sophomore Year		
English 202	3	..
Economics 201 and 203	3	3
Psychology 100	..	3
FMCD 250	3	..
Family Housing HSAD 241	..	3
Sociology 100	3	..
Math 111 or 140 or Statistics BSAD 230	3-4	..
Consumer Product Information	..	3
Elective (Math 141 for students completing this math sequence)	..	3-4
	15-16	15-16
Junior Year		
Economics of Consumption CNEC 435	..	3
Fine Arts Requirement	..	3
Consumer Product Information	..	6
Statistics BSAD 230 or 330	..	3
Economics 401 and 403	..	6
Electives	..	9
		30
Senior Year		
Consumer Behavior CNEC 437	..	3
The Consumer and the Law CNEC 431	..	3
History	..	6
Marketing BSAD 350	..	3
Electives	..	15-17
		30-32

TEXTILES AND CONSUMER ECONOMICS

Professor and Chairman: Smith.
Associate Professors: Buck and Dardis.
Assistant Professors: Heagney, Spivak and Wilbur.
Instructors: Eyler, Jones and Pledger.

TEXTILES AND APPAREL

TXAP 221 (CLTH 010). APPAREL I. (3)
Six hours of laboratory per week. A study of the fundamental principles and processes of pattern design and apparel construction. Students will relate flat pattern and construction techniques to apparel design problems.

TXAP 222 (CLTH 021). APPAREL II. (3)
Six hours of laboratory per week. Prerequisites: TXAP 221 and TEXT 150. A continuation of Apparel I involving more advanced problems. Emphasis is placed on successful integration of pattern design with construction processes in contemporary fabrics.

TXAP 385 (185). JUNIOR HONORS SEMINAR. (1)
Spring semester. Limited to juniors in the departmental Honors Program. Readings, reports and discussion of selected topics.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

TXAP 420 (CLTH 120). APPAREL DESIGN: DRAPING. (3)
Two three-hour laboratory periods per week. Prerequisites: TXAP 222 and APDS 101. Students explore pattern

design through draping on the human form. Emphasis is on the interrelationships between material, design and form.

TXAP 425 (CLTH 122). APPAREL DESIGN: EXPERIMENTAL PROCESSES. (3)
Two three-hour laboratory periods per week. Prerequisites: TXAP 222, TEXT 250 and APDS 101. Processes are related to fiber and fabric characteristics, style and end-use. Opportunities are provided for students to: 1) learn ways of tailoring by machine and by hand; 2) explore, adapt and create new processes with modern textile materials; and 3) evaluate results in terms of design quality.

TXAP 441 (TXCL 141). CLOTHING AND HUMAN BEHAVIOR. (3)
Three lectures per week. Prerequisites: PSYC 100 and SOCY 100. An exploration of socio-psychological approaches to the study of clothing in relation to human behavior. Social and psychological theories will be examined as possible framework for the study and investigation of clothing.

TXAP 445 (TXCL 145). HISTORY OF COSTUME I. (3)
Fall semester. Three lectures per week. Prerequisite: University history requirements. The Wrap-style Dress. A critical study of the various forms of dress; analyzing shape and form of garments and the component parts of which they are made, taking special note of the distinctive styles and unique shapes which help distinguish one period from another; relating the history of costume to events of achievements, to the social attitudes and development of the various times and cultures of man.

TXAP 447 (TXCL 147). HISTORY OF COSTUME II. (3)
Spring semester. Three lectures per week. Prerequisite: Same as for History of Costume I. The Shaped-style Dress. A critical study of the various forms of dress; analyzing shape and form of garments and the component parts of which they are made, taking special note of the distinctive styles and unique shapes which help distinguish one period from another; relating the history of costume to events, to achievements, to the social attitudes and development of the various times and culture of man.

TXAP 488 (TXAP 188). SENIOR HONORS THESIS. (3-4)
Limited to students in the department Honors Program. An independent literary, laboratory or field study, conducted throughout the student's senior year. Student shou'd register in both fall and spring.

TXAP 498 (198). SPECIAL STUDIES. (2-4)
Independent study by an individual student or by a group of students in advanced work not otherwise provided in the department. Students must prepare a description of the study they wish to undertake. The plan must be approved by the faculty directing the study and the department chairman.

TEXTILES

TEXT 105 (TXCL 005). TEXTILES IN CONTEMPORARY LIVING. (3)
Three lectures per week. A multidisciplinary approach to the consumer in the near environment with emphasis on apparel and environmental textiles.

TEXT 150 (050). INTRODUCTION TO TEXTILE MATERIALS. (3)
Two lectures and one two-hour laboratory per week. An introduction to the properties of textile materials. Behavior of textile materials are observed in relation to environmental conditions which influence aesthetics, comfort and performance.

TEXT 250 (055). TEXTILE MATERIALS. EVALUATION AND CHARACTERIZATION. (3)
Two lectures and one two-hour laboratory per week. Prerequisite: TEXT 150. An investigation of the behavior of textile materials in relation to environmental factors and conditions of service influencing performance, comfort and aesthetics. Laboratory experience provides an opportunity to explore a variety of textile materials and methods of evaluation.

TEXT 355 (TXCL 128). ENVIRONMENTAL TEXTILES. (3)
Three lectures per week. Prerequisite: TEXT 150. A consideration of the properties, performance and care of textile materials other than clothing used in the near environment. Included are furnishings, floor coverings, wall treatments and recreational and structural materials. Environmental conditions such as soiling, heat, radiation, weathering, aging, moisture and solvents will be considered.

TEXT 385 (185). JUNIOR HONORS SEMINAR. (1)
Spring semester. Limited to juniors in the departmental Honors Program. Readings, reports and discussion of selected topics.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

TEXT 452 (102). TEXTILE SCIENCE: CHEMICAL STRUCTURE AND PROPERTIES OF FIBERS. (3)
Two lectures and one three-hour laboratory per week. Prerequisites: CHEM 104 or consent of instructor. The chemical structure, properties and reactions of the major classes of natural and man-made fibers. Emphasis is placed upon the relationship between molecular structure and physical properties of fibers and fabrics. Laboratory includes chemical identification of fibers, preparation of selected fibers and examination of chemical reactions and properties of fibers.

TEXT 454 (154). TEXTILE SCIENCE: FINISHES. (3)
Two lectures and one three-hour laboratory per week. Prerequisite: TEXT 452 or consent of instructor. A study of the chemical reactions and mechanisms involved in imparting water repellance, crease resistance and crease recovery properties, shrink-resistance, flame resistance, soil-release properties and moth and mildew resistance to textile materials. Properties of the finished material which effect its end-use will also be examined. Laboratory work includes the application of finishes, identification of finishes and a study of the properties of finished fabrics.

TEXT 456 (150). TEXTILE SCIENCE: CHEMISTRY AND PHYSICS OF FIBERS AND POLYMERS. (3)
Two lectures and one three-hour laboratory per week. Prerequisite: consent of instructor. The theory of fiber structure and its relationship to chemical and physical properties of natural and man-made fibers. Laboratory includes study of performance of textile materials in relation to their chemical and physical properties.

TEXT 463 (153). HISTORY OF TEXTILES. (3)
Three lectures per week. Prerequisite: TEXT 150 or consent of instructor. A study of historic and contemporary fibers and fabrics. Emphasis will be placed on the analysis of designs and techniques of decorating fabrics and the relationship of textiles to the aesthetic and developmental cultures of society.

TEXT 465 (165). ECONOMICS OF THE TEXTILE AND APPAREL INDUSTRIES. (3)
Fall semester. Three lectures per week. Prerequisites: ECON 201 and 203. Trends in the production and consumption of textiles and apparel; economic analysis of the textile and apparel industries; factors affecting changes in output, price, location and market structure.

TEXT 488 (188). SENIOR HONORS THESIS. (3-4)
Limited to students in the departmental Honors Program. An independent literary, laboratory of field study, conducted throughout the student's senior year. Student should register in both fall and spring

TEXT 498 (198). SPECIAL STUDIES. (2-4)
Independent study by an individual student or by a group of students in adanced work not otherwise provided in the department. Students must prepare a description of the study they wish to undertake. The plan must be approved by the faculty directing the study and the department chairman.

CONSUMER ECONOMICS

CNEC 385 (185). JUNIOR HONORS SEMINAR. (1) Spring semester. Limited to juniors in the departmental Honors Program. Readings, reports and discussion of selected topics.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

CNEC 431 (131. THE CONSUMER AND THE LAW. (3) Three lectures a week. A study of legislation affecting consumer goods and services. Topics covered include product safety and liability, packaging and labeling, deceptive advertising, and consumer credit. The implications of such legislation for consumer welfare with particular emphasis on the disadvantaged groups in our society will be examined.

CNEC 435 (135). ECONOMICS OF CONSUMPTION. (3) Spring semester. Three lectures per week. Prerequisites: ECON 201 and 203 or ECON 205 for non-majors. The application of economic theory to a study of consumer decision-making and its role in a market economy at both the individual and aggregate levels. Topics covered include empirical studies of consumer spending and saving, the consumer in the market and collective consumption.

CNEC 437 (137). CONSUMER BEHAVIOR. (3) Three lectures per week. Prerequisites: PSYC 100 and SOCY 100. An application of the behavioral sciences to a study of consumer behavior. Current theories, models and empirical research findings are explored.

CNEC 488 (188). SENIOR HONORS THESIS. (3-4) Limited to students in the departmental Honors Program. An independent literary, laboratory or field study, conducted throughout the student's senior year. Student should register in both fall and spring.

FOR UNDERGRADUATES

CNEC 498 (198). SPECIAL STUDIES. (2-4) Independent study by an individual student or by a group of students in advanced work not otherwise provided in the department. Students must prepare a description of the study they wish to undertake. The plan must be approved by the faculty directing the study and the department chairman.

FOR GRADUATES

See the *Graduate School Catalog* for descriptions.

TEXT 600 (200). SPECIAL STUDIES IN TEXTILES. (2-4)
TXAP 620 (CLTH 220). SPECIAL STUDIES IN CLOTHING. (2-4)
TXAP 630 (TXCL 230). SEMINAR. (1)
TEXT 632 (TXCL 232). ECONOMICS OF TEXTILES AND CLOTHING. (3)
TXAP 633 (TXCL 233). SYNTHESES OF BEHAVIORAL SCIENCE CONCEPTS IN TEXTILES AND CLOTHING. (3)
TXAP 799 (TXCL 399). RESEARCH. (1-6)

FMCD 270—Professional Seminar	2
Math Requirement	3
FMCD 250—Decision Making in Family Living	3
FMCD 260—Family Relations	3
Supportive Courses	6
Electives	3
Total	34-36

Typical Junior Year	Semester Hours
FMCD 431—Family Crisis and Disintegration	3
FMCD 330—Family Patterns	3
EDHD 413, 306 or 411—Human Development	6
History Requirement	6
FMCD 332—The Child in the Family	3
Supportive Courses	6
Electives	6
Total	33

Typical Senior Year	Semester Hours
FMCD 487—Legal Aspects of Family Problems	3
FMCD 485—Introduction to Family Counseling	3
FMCD 344, 345 or 346—Practicum or Living Experience with Families	3-6
Supportive Courses	6
Electives	15
Total	30-33

DEPARTMENT OF FAMILY AND COMMUNITY DEVELOPMENT

In the fall of 1968 the areas of (1) General Home Economics, (2) Extension, (3) Family Life and Management, and (4) Home Economics Education in this college were integrated as one department, the Department of Family and Community Development. Commitments to students who entered the General or Extension programs prior to or at registration in the spring of 1969 will be fulfilled, but future students will enroll in one of the newly devised areas of concentration within the Department of Family and Community Development: Family Studies, Community Studies, Management and consumer Studies, or Home Economics Education.* Students who formerly would have enrolled in the Extension curriculum will enroll in the Community Studies emphasis.

These areas of concentration will prepare students for roles as family life educators, extension specialists, consumer consultants, mental health team members, and teachers of home economics at the secondary level.

FAMILY STUDIES CURRICULUM

Supportive courses will be selected from either Home Economics or Sociology-Psychology.

Typical Freshman Year	Semester Hours
ENGL 101, 201—Composition and Literature	6
PSYC 100	3
FMCD 105—Introduction to Family Living	3
APDS 101—Fundamentals of Design or APDS 104—Art History	3
SOCY 100—Sociology of American Life	3
FOOD 110—Food and Nutrition of Individuals and Families or NUTR 100	3
TEXT 105—Textiles in Contemporary Living	3
Biological Science	3-4
Health and Physical Education Requirements	4
Total	31-32

Typical Sophomore Year	Semester Hours
ENGL 202—Composition and World Literature	3
Physical Science	3-4
SPCH 107 or 100—Public Speaking	2-3
ECON 205—Fundamentals of Economics	3
Fine Arts or Philosophy	3

*Students in Home Economics Education may enroll in either the College of Home Economics or the College of Education.

COMMUNITY STUDIES CURRICULUM

Supportive courses will be chosen from the following areas:

Home economics courses.

Sociology and/or psychology or family life courses in the Department of Family and Community Development beyond the core requirements.

Government and/or economics, or management and consumer problems courses in the Department of Family and Community Development beyond the core requirements.

Typical Freshman Year	Semester Hours
ENGL 101, 201—Composition and Literature	6
Math Requirement	3
SOCY 100—Introduction to Sociology	3
FOOD 110—Food & Nutr. of Individuals & Families OR NUTR 100	3
FMCD 105—Introduction to Family Living	3
Biological Science	4
APDS 101—Fund. of Design OR APDS 004—Art History	3
TEXT 105—Tex. in Contemporary Living	3
PSYC 100—Introduction to Psychology	3
Physical Education and Health Requirement	4
Total	35

Typical Sophomore Year	Semester Hours
ENGL 202—World Literature	3
Fine Arts or Philosophy	3
CHEM 103 (or other Science)	3-4
ECON 205—Fund. of Economics	3
FMCD 250—Decision Making in Family Living	3
SPCH 107 or 100—Public Speaking	2-3
FOOD 200—Scientific Principles of Food	3
FMCD 270—Professional Seminar or Elective	2-3
History	3
Supportive Courses	4
Total	29-32

Typical Junior Year	Semester Hours
FMCD 330—Family Patterns or SOCY 443	3
FMCD 341—Personal and Family Finance	3
SOCY 230—Dynamics of Social Interaction	3
FOOD 260—Meal Management OR FOOD 300—Economics of Food Consumption	3
Supportive Courses	12
Electives	6
Total	30

Typical Senior Year	Semester Hours
FMCD 345—Practicum with Families OR FMCD 344—Residence Experience OR FMCD 346—Living Experiences with Families	3
FMCD 370—Communication Skills	3
SOCY 330—Community Organization	3
History Requirement	3
Supportive Courses	6
Electives	12
Total	30

MANAGEMENT AND CONSUMER STUDIES CURRICULUM

Supportive courses will be selected in blocks from economics, business administration, public relations, sociology, psychology, or family life.

Typical Freshman Year	Semester Hours
ENGL 101—Composition	3
Math Requirement	3
TEXT 105—Textiles in Contemporary Living	3
SOCY 100—Introduction to Sociology	3
PSYC 100—Introduction to Psychology	3
CHEM 103, OR Physical Science Requirement	3-4
FOOD 110—Food & Nutr. of Individuals and Families OR NUTR 100	3
SPCH 107 or 100—Public Speaking	2-3
APDS 101—Fundamentals of Design OR APDS 104—Art History	3
Health and Physical Education Requirements	4
Total	30-32

Typical Sophomore Year	Semester Hours
FMCD 270—Professional Seminar	2
ECON 201 and ECON 203—Principles of Econ.	6
Biological Science	3-4
PSYC 221—Social Psychology	3
TXAP 221—Apparel I OR TEXT 150—Intro. to Textile Materials	3
ENGL 201 and 202—Literature	6
FMCD 250—Decision Making in Family Living	3
Fine Arts or Philosophy	3
FOOD 200 or Elective	3
Total	32-33

Typical Junior Year	Semester Hours
FMCD 330—Family Patterns	3
FMCD 280—Household Equipment and Space Utilization OR HSAD 241—Family Housing	3-4
FMCD 341—Personal and Family Finance	3
Statistics	3
History	6
SOCY 230—Dynamics of Social Interaction	3
FOOD 260—Meal Management OR FOOD 300—Food Economics	3
Supportive	6
Total	30-31

Typical Senior Year	Semester Hours
FMCD 332—The Child in the Family	3
FMCD 443—Consumer Problems	3
FMCD 344—Resident Experience OR FMCD 345—Practicum	3
TEXT 150—Consumer Textiles	3
Supporting Courses	9
Supporting Courses	3
Electives	14-19

HOME ECONOMICS EDUCATION CURRICULUM

Students electing this curriculum may be registered in the College of Home Economics or in the College of Education.

The focus of the curriculum is designed to prepare teachers to concentrate on contemporary family functions. This is implemented through the required courses listed below.

Fifteen hours of the total curriculum include an area of concentration which must be unified in content and which will be chosen by the student.*

*Area of Concentration: 15 semester hours
A) Including maximum of two home economics courses, with the remainder of the 15 hours in supporting behavioral, physical and biological sciences, philosophy, special education, or human development.
B) Of the 15 hours, nine must be upper division

Typical Freshman Year	Semester I	Semester II
ENGL 101 or 171—Composition	3	..
SOCY 100—Introduction to Sociology	3	..
FMCD 105—Introduction to Family Living	3	..
FOOD 110—Food and Nutr. of Indiv. & Fam. OR		
NUTR 100—Elements of Nutrition	3	..
MATH requirement	3-4	..
PHED	1	1
PSYC 100—Introduction to Psychology	..	3
APDS 101—Fundamentals of Design	..	3
ENGL 201—World Literature	..	3
HLTH 105—Science and Theory of Health	..	2
TEXT 105—Textiles in Contemp. Living	..	3
EDSE 288—Seminar: Home Ec Education	..	1
Total	16-17	16

Typical Sophomore Year		
ENGL 202—World Literature	3	..
HIST	3	..
CHEM 103—General Chemistry	4	..
HSAD 240—Design and Furnishings in the Home OR HSAD 241—Family Housing	3	..
SPCH 100—Public Speaking	3	..
TXAP 221—Principles and Methods of Clothing Design	..	2
HIST	..	3
CHEM 104—General Chemistry	..	4
FOOD 200—Scientific Principles of Food	..	3
Fine Arts or Philosophy Requirement	..	3
FMCD 250—Decision Making in Family Living	..	3
Total	16	18

Typical Junior Year		
EDUC 300—Human Development and Learning	6	..
FOOD 260—Meal Management	3	..
FMCD 341—Personal and Family Finance or alternative	3	..
Area of concentration*	3	..
FMCD 332—The Child in the Family OR EDHD 411—Growth and Development in Early Childhood	..	3
ECON 205—Fundamentals of Economics	..	3
EDSE 425—Problems in Teaching Home Economics	..	3
ZOOL 101 or MICB 200	..	4
EDSE 423—Field Experience: Child Devp.	1	..
Area of concentration*	..	3
Total	16	16

Typical Senior Year	Semester I	Semester II
EDSE 340—Curriculum, Instruction and Observation	3	..
EDSE 330—Principles and Methods of Secondary Education	3	..
EDSE 361—Teaching Secondary Vocational Home Economics	8	..
FMCD 344—Resident Experience in Home Management OR FMCD 345—D. H. M. Practicum	3	..
FMCD 260—Family Relations OR		
SOCY 443—The Family and Society	..	3
EDUC 301—Foundations of Education	..	3
Area of concentration*	..	9
Total	17	15

FAMILY AND COMMUNITY DEVELOPMENT

Associate Professor and Chairman: Gaylin.
Associate Professors: Lemmon and Wilson.
Assistant Professors: Brabble, Churaman, Olson and Orvedal.
Instructors: Garrison and MacMahon.
Lecturer: Mannino.

FMCD 105 (005). INTRODUCTION TO FAMILY LIVING. (3)
Interrelations of the individual and his family through the various stages of the family life cycle; underlying principles of guidance of children as applied to home situations.

FMCD 250 (050). DECISION MAKING IN FAMILY LIVING. (3)
Decision making in relation to family values, philosophies, goals, and resources, and general socio-economic conditions.

FMCD 260 (060). FAMILY RELATIONS. (3)
Prerequisites: PSYC 100 or SOCY 100. Study of interpersonal relationships within the family as they are affected by psycho-social influences.

FMCD 270 (180). PROFESSIONAL SEMINAR. (2)
Survey of professional opportunities, responsibilities and trends in each departmental area of emphasis. Concentration will be on the development of personal qualities and professional ethics essential for effective occupational performance.

FMCD 280 (080). HOUSEHOLD EQUIPMENT AND SPACE UTILIZATION. (4)
Two lectures, two laboratory sessions. Study of household equipment and space utilization as they affect family members in task performance. Emphasis is on the consumer's viewpoint, supported by laws of the physical sciences.

FOR ADVANCED UNDERGRADUATES

FMCD 330 (130). FAMILY PATTERNS. (3)
Prerequisites: FMCD 260 and PSYC 100. A study of family patterns within the sub-cultures of America and various other cultures. Emphasis will be given to those patterns and life styles which evolve as adaptations to cultural demands.

FMCD 332 (132). THE CHILD IN THE FAMILY. (3)
Three lectures. Prerequisite: PSYC 100 or SOCY 100. Study of the child from prenatal stage through adolescence, with emphasis on responsibility for guidance in the home. Biological and psychological needs as they affect the child's relationship with his family and peers.

FMCD 341 (141). PERSONAL AND FAMILY FINANCE. (3)
Study of individual and family finances with particular emphasis upon financial planning, savings, insurance, investments, income taxes, and use of credit.

FMCD 344 (144). RESIDENT EXPERIENCE IN HOME MANAGEMENT. (3)
Four to nine weeks. Prerequisite: FMCD 250. Group living and management experience providing opportunity to examine decision patterns, participate in group decision making and analyze value systems and resource utilization which differ from the student's own. (Each student pays $60 which is used for food and supplies. The University Housing Office bills non-dormitory students for room rent at the rate of $5 per week.)

FMCD 345 (145). PRACTICUM WITH FAMILIES, CHILDREN OR HOME MANAGEMENT. (3)
A. Families
B. Children and Youth
C. Management and Consumer Studies
A planned, supervised experience in which the student is a participant/observer in a community program serving families. Monthly seminars are held.
D. Applied Home Management
An alternate for FMCD 344, it provides an opportunity

for the student who is currently managing her own home to meet objectives similar to those stated for FMCD 344.

FMCD 370 (170). COMMUNICATION SKILLS AND TECHNIQUES IN HOME ECONOMICS. (3)
Principles and techniques for professional demonstration and presentation of home economics and its related areas with selected experience in television, radio, creative writing, and photography.

FMCD 431 (131). FAMILY CRISES AND DISINTEGRATION. (3)
Prerequisite: PSYC 100. A study of significant changes within the family setting which ultimately require major adjustments in inter-personal and intra-personal relations.

FMCD 443 (143). CONSUMER PROBLEMS. (3)
Consumer practices of American families. Merchandising practices as they affect the consumer. Organizations and laws in the interest of the consumer.

FMCD 446 (146). LIVING EXPERIENCES WITH FAMILIES. (3-6)
a. Domestic Intercultural
b. International Intercultural
Prerequisites: FMCD 280, ANTH 101; FMCD 250; optional, language competence. An individual experience in living with families of a sub-culture within the U.S. or with families of another country, participating in family and community activities. A foreign student may participate and live with an American family.

FMCD 485 (185). INTRODUCTION TO FAMILY COUNSELING. (3)
Prerequisites: PSYC 100 and 235; FMCD 105 and 331. Basic principles of counseling and its effect on family action.

FMCD 487 (188). LEGAL ASPECTS OF FAMILY PROBLEMS. (3)
Laws and legal involvement that directly affect specific aspects of the family: adoption, marriage, estate planning, property rights, wills, etc. Emphasis will be given to the involvement of a professional lawyer; principles and interpretation of the law.

FMCD 499 (190). SPECIAL TOPICS. (1-3)
a. Family Studies
b. Community Studies
C. Management and Consumer Studies

FOR GRADUATES

See the *Graduate School Catalog* for descriptions.

HOEC 601 (201). METHODS OF RESEARCH IN HOME ECONOMICS. (3)

HOEC 602 (202. INTEGRATIVE ASPECTS OF HOME ECONOMICS. (2)

HOEC 638, 648, 658, 668, 678, 688, 698 (290). SPECIAL TOPICS. (1-6)

HOEC 799 (399). THESIS RESEARCH. (1-6)

HOME ECONOMICS EDUCATION

EDSE 347 (140). CURRICULUM, INSTRUCTION, AND OBSERVATION. (3)
The place and function of home economics education in the secondary school curriculum. Phliosophy of education for home and family living; characteristics of adolescence, construction of source units, lesson plans, and evaluation devices; directed observations in junior and senior high school home economics departments.

EDSE 370 (148H). TEACHING VOCATIONAL HOME ECONOMICS IN THE SECONDARY SCHOOLS. (2-8)
First and second semesters.

EDSE 425 (125). PROBLEMS IN TEACHING HOME ECONOMICS. (3)
A study of the managerial aspects of teaching and administering a homemaking program; the physical environment, organization and sequence of instructional units; resource materials, evaluation; home projects.

EDSE 426 (126). EVALUATION OF HOME ECONOMICS. (3)
The meaning and function of evaluation in education; the development of a plan for evaluating a homemaking program with emphasis upon types of evaluation devices, their construction and use.

FOR GRADUATES

EDSE 705 (261). TRENDS IN THE TEACHING AND SUPERVISION HOME ECONOMICS. (3)
See the *Graduate School Catalog* for descriptions.

EDSE 826 (260). SEMINAR IN HOME ECONOMICS EDUCATION. (3)

DEPARTMENT OF HOUSING AND APPLIED DESIGN

The fundamental purpose of programs of concentration in this area is to provide a broad, general education in addition to individually and professionally oriented instruction in design. Dependent upon elected allied areas of study, professional opportunities include: design of interiors, fashions, advertising, home furnishings; illustration of fashions and interiors; sales promotion or retailing of wearing apparel, homes and home furnishings; fashion or home furnishings journalism; housing consultant, urban development programs.

ADVERTISING DESIGN CURRICULUM

	Semester I	Semester II
Typical Freshman Year		
ENGL 101 or 171—Composition	3	..
ENGL 201—World Literature	..	3
Math Requirement	3-4	..
Science Requirement	..	3-4
SPCH 107 or 100—Public Speaking	2-3	..
Arts 110—Drawing I	3	..
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
EDIN 101A—Mechanical Drawing	..	2
FOOD 110—Food and Nutrition of Individuals and Families or NUTR 100—Elements of Nutrition	..	3
APDS 101—Fundamentals of Design	3	..
APDS 102—Design II	..	3
Total	17-19	15-16
Typical Sophomore Year		
ENGL 202—World Literature	3	..
PSYC 100—Introduction to Psychology	3	..
ECON 205—Fundamentals of Economics	..	3
Science Requirement	..	3-4
FMCD 250—Decision Making in Family Living	..	3
TEXT 105—Textiles in Contemporary Living	3	..
APDS 210—Presentation Techniques	3	..
APDS 211—Action Drawing—Fashion Sketching	..	3
APDS 230—Silk Screen Printing	..	3
APDS 237—Photography	2	..
APDS 103—Design III—Three-Dimensional Design	3	..
Total	17	15-16
	Semester I	Semester II
Typical Junior Year		
History Requirement	3	3
SOCY 100—Sociology of American Life	3	..
ARTH 450—Twentieth Century Art	..	3

EDIN 134—Graphic Arts I	3	..
APDS 320—Fashion Illustration	3	..
APDS 330—Typography and Lettering	3	..
APDS 331—Advertising Layout	..	3
APDS 332—Display Design	..	3
Supporting Elective	..	3
Total	15	15
Typical Senior Year		
PHIL 330—Philosophy of Art	3	..
APDS 430, 431—Advanced Problems in Advertising Design	3	3
APDS 337—Adanced Photography	..	2
APDS 380—Professional Seminar	..	2
Supporting Electives	3	3
Free Electives	6	3-4
Total	15	13-14

COSTUME CURRICULUM

	Semester I	Semester II
Typical Freshman Year		
ENGL 101 or 171—Composition	..	3
Fine Arts Requirement	3	..
SOCY 100—Sociology of American Life	3	..
ARTS 110—Drawing I	..	3
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
Science Requirement	..	3-4
TEXT 105—Textiles in Contemporary Living	3	..
APDS 101—Fundamentals of Design	3	..
APDS 102—Design II	..	3
APDS 210—Presentation Techniques	..	3
Total	15	16-17
Typical Sophomore Year		
ENGL 201, 202—World Literature	3	3
Math Requirement	3-4	..
Science Requirement	..	3-4
SPCH 107 or 100—Public Speaking	..	2-3
FOOD 110—Food and Nutrition of Individuals and Families or NUTR 100—Elements of Nutrition	3	..
FMCD 250—Decision Making in Family Living	..	3
APDS 103—Design III—Three-Dimensional Design	3	..
APDS 211—Action Drawing—Fashion Sketching	3	..
APDS 220—Introduction to Fashion Design	..	3
Total	15-16	14-16
Typical Junior Year		
PSYC 100—Introduction to Psychology	3	..
History Requirement	3	3
ARTH 261—History of Art	3	..
ECON 205—Fundamentals of Economics	..	3
APDS 237—Photography	2	..
APDS 320—Fashion Illustration	3	..
APDS 321—Fashion Design and Illustration	..	3
APDS 330—Typography and Lettering	..	3
Supporting Electives	3	3
Total	17	15
Typical Senior Year		
APDS 322—Advanced Costume	4	..
APDS 331—Advertising Layout	..	3
APDS 332—Display Design	3	..
APDS 380—Professional Seminar	..	2
Supporting Electives	3	..
Free Electives	6	9
Total	16	14

CRAFTS CURRICULUM

	Semester I	Semester II
Typical Freshman Year		
ENGL 101 or 171—Composition	3	..
ENGL 201—World Literature	..	3
History Requirement	3	..
SOCY 100—Sociology of American Life	..	3
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
FOOD 110—Food and Nutrition of Individuals and Families or NUTR 100—Elements of Nutrition	..	3
TEXT 105—Textiles in Contemporary Living	3	..
APDS 101—Fundamentals of Design	3	..
APDS 102—Design II	..	3
CRAF 101—Craft Fundamentals and Materials	..	3
Total	15	16
Typical Sophomore Year		
ENGL 202—World Literature	3	..
Math Requirement	3-4	..
Science Requirement	..	3-4
PSYC 100—Introduction to Psychology	..	3
SPCH 107 or 100—Public Speaking	..	2-3
EDIN 102—Woodworking I	3	..
APDS 103—Design III—Three-Dimensional Design	3	..
APDS 210—Presentation Techniques	3	..
APDS 211—Action Drawing—Figure Sketching	..	3
CRAF 241—Decorative Textiles	..	3
Total	15-16	14-16
Typical Junior Year		
PHIL 330—Philosophy of Art	3	..
Science Requirement	3-4	..
ECON 205—Fundamentals of Economics	..	3
FMCD 250—Decision Making in Family Living	..	3
APDS 236—Silk Screen Printing	3	..
APDS 237—Photography	..	2
CRAF 220—Ceramics—Material and Processes	3	..
CRAF 320—Advanced Ceramics I	..	3
CRAF 230—Metalry I	..	3
CRAF 240—Weaving	3	..
Free Elective	..	3
Total	15-16	17
Typical Senior Year		
History Requirement	3	..
APDS 380—Professional Seminar	..	2
CRAF 420—Advanced Ceramics II	3	..
CRAF 330—Advanced Metalry I	3	..
CRAF 428 or 438 or 448—Individual Problems in Crafts	3	3
Supporting Electives	3	6
Free Electives	..	4-6
Total	15	15-17

HOUSING CURRICULUM

	Semester I	Semester II
Typical Freshman Year		
SOCY 100—Sociology of American Life	3	..
SPCH 100 or 107—Public Speaking	2-3	..
FOOD 110—Food and Nutrition of Individuals and Families	3	..
TEXT 105—Textiles in Contemporary Living	3	..
APDS 101—Fundamentals of Design	3	..

Physical Education	1	1
ENGL 101 or 171—Composition	..	3
PSYC 100—Introduction to Psychology	..	3
HLTH 105—Science and Theory of Health	..	2
TXAP 221—Apparel I or exemption	..	3
APDS 102—Design II	..	3
APDS 210—Presentation Techniques	..	3
Total	15-16	18

	Semester I	Semester II
Typical Sophomore Year		
ENGL 201, 202—World Literature	3	3
Science Requirement	3-4	..
PSYC 221—Social Psychology	..	3
FMCD 250—Decision Making in Family Living	3	..
TEXT 105—Consumer Textiles	..	3
APDS 103—Design III—Three-Dimensional Design	3	..
HSAD 240—Design and Furnishings in the Home	3	..
HSAD 241—Family Housing	..	3
HSAD 246—Materials of Interior Design	..	3
Total	15-16	15
Typical Junior Year		
Math Requirement	3	..
Science Requirement	3-4	..
History Requirement	3	..
SOCY 230—Dynamics of Social Interaction	..	3
Fine Arts Requirement	..	3
Elective	3	..
FMCD 260—Family Relations or alternative	..	3
HSAD 342—Space Development	3	..
HSAD 343—Interior Design I	..	3
Supporting Elective	..	3
Total	15-16	15
Typical Senior Year		
History Requirement	3	..
ECON 205—Fundamentals of Economics	..	3
ARTH 341—Masterpieces of Architecture	..	3
FMCD 330—Family Patterns or alternative	3	..
FMCD 332—The Child in the Family	..	3
Supporting Electives	3	3
Free Electives	6	3
Total	15	15

INTERIOR DESIGN CURRICULUM

	Semester I	Semester II
Typical Freshman Year		
ENGL 101 or 171—Composition	3	..
ENGL 201—World Literature	..	3
SOCY 100—Sociology of American Life	3	..
History Requirement	..	3
Math Requirement	..	3-4
HLTH 105—Science and Theory of Health	2	..
Physical Education	1	1
EDIN 101A—Mechanical Drawing	2	..
TEXT 105—Textiles in Contemporary Living	..	3
FOOD 110—Food and Nutrition of Individuals and Families OR		
NUTR 100—Elements of Nutrition	3	..
APDS 101—Fundamentals of Design	3	..
APDS 102—Design II	..	3
Total	17	16-17
Typical Sophomore Year		
ENGL 202—World Literature	3	..
PSYC 100—Introduction to Psychology	3	..
Science Requirement	..	3-4
ECON 205—Fundamentals of Economics	..	3
SPCH 100 or 107—Public Speaking	2-3	..
FMCD 250—Decision Making in Family Living	3	..
TEXT 150—Consumer Textiles	..	3
APDS 103—Design III—Three-Dimensional Design	3	..
APDS 237—Photography	..	2
HSAD 246—Materials of Interior Design	..	3
APDS 210—Presentation Techniques	3	..
Total	17-18	14-15
Typical Junior Year		
History Requirement	3	..
PHIL 330—Philosophy of Art	..	3
TEXT 463—International Textiles	..	2
HSAD 340—Period Homes and Their Furnishings	3	..
HSAD 342—Space Development	3	..
HSAD 343—Interior Design I	..	3
Supporting Electives	3	3
Free Electives	3	3
Total	15	14
Typical Senior Year		
Science Requirement	3-4	..
HSAD 341—Contemporary Developments in Architecture, Interiors, Furnishings	..	3
HSAD 344—Interior Design II	3	..
HSAD 345—Professional Aspects of Interior Design	..	3
HSAD 440—Interior Design III	..	4
HSAD 441—Interior Design IV	..	4
Supporting Electives	3	..
Free Electives	6	..
Total	15-16	14

HOUSING, APPLIED DESIGN AND CRAFTS

Professor and Chairman: Shearer.
Assistant Professor: Roper.
Instructors: Cole, Erdahl, Holvey, McDonnell, Nelson, Nisonger, Odland, Ritzmann, Spiller, Williams and Zimmerman.
Lecturers: Davis, Hillerman and Ribalta.

APPLIED DESIGN

APDS 101 (001). FUNDAMENTALS OF DESIGN. (3)
Knowledge of basic art elements and principles gained through design problems which employ a variety of media. (Meets requirement for Home Economics core.) (Staff)

APDS 102 (002). DESIGN II. (3)
Prerequisite: APDS 101. Continued exploration of design as a means of visual expression with added emphasis on color and lighting. (Staff)

APDS 103 (003). DESIGN III: THREE-DIMENSIONAL DESIGN. (3)
Three laboratory periods. Prerequisites: APDS 101, 102. Creative efforts directed to discriminating use of form, volume, depth, and movement. (Staff)

APDS 104 (004). SURVEY OF ART HISTORY. (3)
A rapid survey of Western culture expressed through and influenced by the visual arts: monumental and residential architecture; furniture, textiles and costume; painting and sculpture. (Meets requirements for Home Economics core.) (Staff)

APDS 210 (010). PRESENTATION TECHNIQUES. (3)
Three laboratory periods. Prerequisites: APDS 101, 102 or equivalent. Comparative approach to basic presentation techniques used in the several areas of commercial design. (Staff)

APDS 211 (011). ACTION DRAWING-FASHION SKETCHING. (3)
Second semester. Three laboratory periods. Prerequisites: APDS 101 and consent of instructor. Study of the balance and proportion of the human figure. Sketch techniques applied to action poses and fashion drawing in soft and lithograph pencils, pastels, water color, Ink. Drawing from model. (Staff)

APDS 212 (012). DESIGN WORSHOP FOR TRANSFERS. (5)
Summer. Prerequisite: APDS 101 or equivalent. Provides opportunity for transfer students to remove deficlences in lower-level design courses. Study of color, lighting and presentation techniques. May be taken no later than one semester after transfer into department.

APDS 220 (020). INTRODUCTION TO FASHION DESIGN. (3)
Three laboratory periods. Prerequisite: APDS 101 or equivalent. Basic fashion figure drawing. Original designs rendered in transparent and opaque water color, soft pencil, pastels, and ink. Primarily for nonmajors. (Staff)

APDS 230 (030). SILK SCREEN PRINTING. (3)
Three laboratory periods. Prerequisites: APDS 101, 102, or equivalent. Use of silk screen processes in execution of original designs for commercial production. (Staff)

APDS 237 (038). PHOTOGRAPHY. (2)
One lecture, three hours laboratory. Prerequisites: APDS 101, 102, or equivalent. Study of fundamental camera techniques. Exploration of the expressive possibilities in relation to the field of design and visual communication. (Staff)

FOR ADVANCED UNDERGRADUATES

APDS 320 (120). FASHION ILLUSTRATION. (3)
First semester. Three laboratory periods. Prerequisites: APDS 101, 102, 103, 210, 211. Fabric and clothing structure as they relate to illustration. Opportunity to explore rendering styles and techniques appropriate to reproduction methods currently used in advertising. Guidance in development of individuality in presentations. (Staff)

APDS 321 (121). FASHION DESIGN AND ILLUSTRATION. (3)
Second semester. Three laboratory periods. Prerequisite: APDS 320. Design and illustration of fashions appropriate to the custom market and to mass production. (Staff)

APDS 322 (122). ADVANCED COSTUME. (4)
First and/or second semesters. Prerequisite: APDS 320 or 321. Advanced problems in fashion illustration or design. Problems chosen with consent of instructor. (Staff)

APDS 330 (130). TYPOGRAPHY AND LETTERING. (3)
Three laboratory periods. Prerequisites: APDS 101, 102. Experience in hand lettering techniques as a means of understanding lettering styles in design composition. Recognition of type faces used in advertisement, book and magazine layout. Effect of printing processes on design choices. (Staff)

APDS 331 (132). ADVERTISING LAYOUT. (3)
First semester. Three laboratory periods. Prerequisites: APDS 330, EDIN 101A. Design of advertising layouts from initial idea to finished layout. Typography and illustration as they relate to reproduction processes used in direct advertising. (Staff)

APDS 332 (136). DISPLAY DESIGN. (3)
Three laboratory periods. Prerequisites: EDIN 101A, APDS 330 or equivalent. Application of design principles to creative display appropriate to exhibits, design shows, merchandising. Display construction. (Staff)

APDS 337 (138). ADVANCED PHOTOGRAPHY. (2)
Two laboratory periods. Prerequisite: APDS 237. Composition, techniques and lighting applicable to illustration, documentation, advertising design, and display. (Staff)

APDS 380 (180). PROFESSIONAL SEMINAR. (2)
Two lecture-discussion periods. Prerequisite: junior standing and consent of instructor. Exploration of professional and career opportunities, ethics, practices, professional organizations. Portfolio evaluation. (Staff)

APDS 430, 431 (134, 135). ADVANCED PROBLEMS IN ADVERTISING DESIGN. (3, 3)
Two laboratory periods. Prerequisite: APDS 331. Advanced problems in design and layout planned for developing competency in one or more areas of advertising design. (Staff)

APDS 437 (139). ADVANCED PHOTOGRAPHY. (3)
Three laboratory periods. Continuation of APDS 337. (Staff)

APDS 499 (190). INDIVIDUAL PROBLEMS IN APPLIED DESIGN. (3-4)
(499A—Advertising; 499B—Costume)
Open only to advanced students who, with guidance, can work independently.

CRAFTS

CRAF 101 (001). CRAFT FUNDAMENTALS AND MATERIALS. (3)
Three laboratory periods. Prerequisite: APDS 101 or equivalent. Introduction to materials and techniques. Recognition of design limitations imposed by inherent quality of materials.

CRAF 102 (002). RECREATIONAL CRAFTS. (2)
Two laboratory periods. Prerequisites: APDS 101 or equivalent. Problems to encourage creative expression in variety of materials. Emphasis on achievement of aesthetic quality in use of easily available materials, simple tools. Suitable for nonmajors.

CRAF 202 (102). CREATIVE CRAFTS. (3)
Three laboratory periods. Prerequisite: CRAF 101 or 102. Problems to stimulate creative experimentation as approach to design. Work with paper, fabric, clay, wood, metal. (Staff)

CRAF 220 (020) CERAMICS I—MATERIALS AND PROCESSES (3)
Three laboratory periods. Prerequisites: APDS 101 and consent of the instructor. Fundamental preparation and use of clay. Execution of original designs while developing elementary skills in the production of clay sculpture and pottery. (Staff)

CRAF 230 (030). METALRY I. (3)
Three laboratory periods. Prerequisites: APDS 101 plus one additional design course, or equivalent. Opportunity to develop basic skills in the execution of creatively conceived design problems in copper, pewter and silver. Standards of craftsmanship as they relate to design quality. (Staff)

CRAF 240 (040). WEAVING. (3)
First semester. Three laboratory periods. Prerequisites: APDS 101, 102, or equivalent, TEXT 105. Basic weaves, patterns drafts. Creative weaving as a study of texture, pattern and color appropriate to purpose. (Staff)

CRAF 241 (041). DECORATIVE TEXTILES. (3)
Second semester. Three laboratory periods. Prerequisites: APDS 101, 102 or equivalent. Execution of original designs appropriate to textile decoration, fibers and fabrics and to the process involved (i.e. batik, block printing, silk screen, stitchery, and applique). (Staff)

FOR ADVANCED UNDERGRADUATES

CRAF 320 (120). ADVANCED CERAMICS I. (3)
Three laboratory periods. Prerequisite: CRAF 220. Experience in experimental development of body and textures, glazes and colors, and their utilization in clay products of original design. Calculation of body and glaze composition. (Staff)

CRAF 330 (130). ADVANCED METALRY I. (3)
Two laboratory periods. Prerequisite: CRAF 230. Advanced application of skills to design and fabrication of metals; jewelry, stone setting, metal casting, cloisonne hand-raised hollow ware. (Staff)

CRAF 340, 341 (140, 141). ADVANCED WEAVING, AND/OR ADVANCED TEXTILE DESIGN. (3, 3)
Two laboratory periods. Prerequisites: CRAF 240, 241. Execution of original textile designs which reflect the

demands both of the custom market and of mass production. Problems chosen with the consent of instructor. (Staff)

CRAF 420 (121). ADVANCED CERAMICS II. (3)
Three laboratory periods. Prerequisite: CRAF 220. Experience in experimental development of body and textures, glazes and colors and their utilization in clay products of original design. Calculation of body and glaze composition.

CRAF 428 (128). INDIVIDUAL PROBLEMS IN CERAMICS. (3)
Prerequisites: CRAF 220, CRAF 320, CRAF 420. Open to students with demonstrated ability* and with the potential for a high level of achievement in studio production or in research. Total undergraduate credit permitted in all individual problems courses in crafts is a maximum of nine hours. Consent of crafts faculty. No less than B average on prerequisites and presentation of work for evaluation.

CRAF 430 (131). ADVANCED METALRY II. (3)
Two laboratory periods. Prerequisite: CRAF 230. Advanced application of skills to design and fabrication of metals; jewelry, stone setting, metal casting, cloisonne hand-raised hollow ware.

CRAF 438 (138). INDIVIDUAL PROBLEMS IN METALRY. (3)
Prerequisites: CRAF 230, CRAF 330, CRAF 430. Open to students with demonstrated ability* and with the potential for a high level of achievement in studio production or in research. Total undergraduate credit permitted in all individual problems courses in crafts as a maximum of nine hours. Consent of crafts faculty.

*No lass than B average on prerequisites and presentation of work for evaluation.

CRAF 448 (148). INDIVIDUAL PROBLEMS IN TEXTILE DESIGN. (3)
Prerequisites: CRAF 240 or CRAF 241 and CRAF 340 or CRAF 341. Open to students with demonstrated ability* and with the potential for a high level of achievement. Total undergraduate credit permitted in all individual problems courses in crafts is a maximum of nine hours. Consent of crafts faculty.

Housing and Interior Design

HSAD 240 (040). DESIGN AND FURNISHINGS IN THE HOME. (3)
Three lectures a week. Prerequisites: APDS 101 or 104. Designed to meet need for basic information and competency in choice and arrangement of home furnishings. For NONMAJORS only. (Staff)

HSAD 241 (041). FAMILY HOUSING. (3)
Housing and its relationship to family living. A study of factors which shape housing design; investigation of group and individual housing needs and values. (Staff)

HSAD 246 (046). MATERIALS OF INTERIOR DESIGN. (3)
Prerequisite: Consent of instructor. Investigation of materials and construction characteristics of interior architecture and furnishings. Emphasis on use, limitations, sources. Directions in current research. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

HSAD 340 (140). PERIOD HOMES AND THEIR FURNISHINGS. (3)
First semester. Prerequisites: APDS 101, HSAD 246, or equivalent. A study of authentic interiors and furnishings. Exploration of style influences apparent in contemporarily produced items. (Staff)

HSAD 341 (141). CONTEMPORARY DEVELOPMENTS IN ARCHITECTURE, INTERIORS, FURNISHINGS. (3)
Second semester. Prerequisite: HSAD 246 and consent of instructor. Style origins and development of twentieth century architecture as living space. Architects, designers, trends, philosophy of relationship of interior space to furnishings. (Staff)

HSAD 342 (142). SPACE DEVELOPMENT. (3)
First semester. One lecture, 2 two-hour laboratories. Prerequisites: APDS 101, 102, 103; INED 101A, or equivalent. A study of blue prints and house construction as they relate to the interior designer. Development and drafting or original plans emphasizing the functional spatial relationship of furnishings to interiors. (Staff)

HSAD 343 (143). INTERIOD DESIGN I. (3)
First semester. One lecture-discussion, two laboratory periods. Prerequisites: APDS 101, INED 210, or equivalent. Complete presentation of rooms; isometric and perspective projections rendered in color; purchase and work orders. Emphasis on individual and family living space. (Staff)

HSAD 344 (144). INTERIOR DESIGN II. (3)
One lecture-discussion, two laboratory periods. Prerequisite: HSAD 343. Continuation of HSAD 343 with emphasis on commercial and contract assignments. (Staff)

HSAD 345 (145). PROFESSIONAL ASPECTS OF INTERIOR DESIGN. (3)
One lecture plus work experience. Professional orientation, ethics, and practices. (Staff)

HSAD 380 (180). PROFESSIONAL SEMINAR. (2)
Two lecture discussion periods. Prerequisite: Junior Junior standing and consent of instructor. Exploration of professional and career opportunities, ethics, practices, professional organizations. Portfolio evaluation.

HSAD 440, 441 (146, 147). INTERIOR DESIGN III, IV. (4, 4)
First and/or second semesters. 8 hours laboratory. prerequisite: HSAD 344. Preparation of complete presentation: work specifications, floor plans, purchase orders, renderings, etc. Portfolio preparation. (Staff)

HSAD 442 (148). READINGS IN HOUSING. (3)
Second semester. Seminar. Prerequisites: SOCY 100, HSAD 241, senior standing. To satisfy individual interests and needs, opportunity afforded for concentrated reading on one or more facets of housing (urban renewal, public housing, etc) Examination of completed research, needed future research. (Staff)

HSAD 488 (188). SELECTED TOPICS IN HOUSING AND INTERIOR DESIGN. (3)
Offered on demand. Designed to meet specific subject matter needs of current and/or immediate concern in areas of housing and interior design.

HSAD 499 (190). INDIVIDUAL STUDY IN HOUSING AND/OR INTERIOR DESIGN. (3-4)
Guidance for the advanced student capable of independent subject matter investigation or creative work. Problem chosen with consent of instructor. (Staff)

COLLEGE OF HOME ECONOMICS

Administrative Officers

BROOKS, Marjory, Dean of the College of Home Economics and Professor of Family Life
B.S., Mississippi State College for Women, 1943; M.S., University of Idaho, 1951; Ph.D., Ohio State University, 1963.

BRABBLE, Elizabeth W., Coordinator of Undergraduate Studies and Human Relations and Assistant Professor in Family Studies
B.S., Virginia State College, 1960; M.S., The Pennsylvania State University, 1966; Ed.D., 1969.

BUCK, Allen C., Coordinator of Graduate Studies and Research and Associate Professor of Textiles and Consumer Economics
B.S., Michigan State University, 1940; M.S., Western Reserve University, 1942; Ph.D., 1947.

Faculty

AHRENS, Richard A., Associate Professor of Food and Nutrition
B.S., University of Wisconsin, 1958; Ph.D., University of California, 1963.

BERDANIER, Carolyn D., Visiting Assistant Professor in Nutrition
M.S., Rutgers University, 1963; Ph.D., 1966.

BOEHNE, J. William, Lecturer in Foods and Nutrition
B.S., Indiana University, 1942.

BUTLER, Lillian C., Associate Professor of Food and Nutrition
B.S., University of Illinois, 1941; M.A., University of Texas, 1945; Ph.D., University of California, 1953.

CHURAMAN, Charlotte V., Assistant Professor of Home Management and Consumer Studies

COLE, Robert A., Instructor in Applied Design
B.A., University of Maryland, 1966; M.A., University of Maryland, 1968.

DARDIS, Rachel, Associate Professor of Textiles and Consumer Economics; Lecturer, Department of Economics
B.S., St. Mary's College, Dublin, Ireland, 1949; M.S., University of Minnesota, 1963; Ph.D., University of Minnesota, 1965.

DAVIS, Fremont, Lecturer in Applied Design

EHEART, Mary S., Assistant Professor of Food and Nutrition
A.B., Park College, 1933; M.A., University of Chicago, 1935.

ERDAHL, William H., Instructor in Applied Design
B.S., Bucknell University, 1962; M.S., University of Wisconsin, 1965; M.F.A., University of Wisconsin, 1968.

GARRISON, Martha, Instructor in Family and Community Development
B.S., Michigan State University, 1938; M.S., University of Maryland, 1963.

GAYLIN, Ned L., Associate Professor and Chairman, Department of Family and Community Development
B.A., University of Chicago, 1956; M.A., University of Chicago, 1961; Ph.D., University of Chicago, 1965.

GRAHAM, Ethel L., Instructor in Foods and Nutrition
B.S., Drexel Institute of Technology, 1961; M.S., University of Maryland, 1964.

HEAGNEY, Eileen M., Assistant Professor of Textiles and Consumer Economics
B.S., Pennsylvania State University, 1941; M.A., Columbia University, 1949.

HILLERMAN, Barbara, Lecturer in Applied Design
B.S., University of Maryland, 1956.

HOLVEY, Samuel B., Instructor in Applied Design
B.A., Syracuse University, 1967; M.A., American University, 1970.

HOPKINS, Leon L., Visiting Associate Professor in Nutrition
M.S., Colorado State University, 1959; Ph.D., University of Wisconsin, 1962.

KNIGHTON, Ruth, Instructor in Food and Nutrition
B.S., University of Massachusetts, 1961; M.S., University of Maryland, 1965.

LEMMON, Louise, Associate Professor of Home Economics Education
B.S., Northern Illinois University, 1946; M.S., University of Wisconsin, 1951; Ed.D., University of Illinois, 1961.

MacMAHON, B. Ellen, Instructor in Family and Community Development
B.S., Madison College, 1963; M.A., Michigan State University, 1967.

MANNINO, Fortune V., Associate Professor in Family and Community Development
B.S., Tulane, 1949; M.S.W., Tulane, 1951; Ph.D., Florida State, 1959.

McDONNELL, Michael L., Instructor in Housing and Interior Design
B.A., North Texas State University, 1967; M.A., North Texas State University, 1969.

NELSON, William E., Instructor in Applied Design and Crafts
A.A., University of Bridgeport, 1964; B.S., 1965; M.S., Florida State University, 1968.

NIFFENEGGER, Elnor J., Instructor in Food and Nutrition
B.S., Iowa State University, 1953; M.S., Montana State University, 1964.

NISONGER, Julie, Instructor in Applied Design and Crafts
B.F.A., Ohio State University, 1944; M.A., University of Maryland, 1967.

ODLAND, Sheldon, Instructor in Housing and Interior Design
B.A., Pennsylvania State University, 1958.

OLSON, David H., Assistant Professor of Family and Community Development
B.A., St. Olaf College, 1962; M.A., Wichita State University, 1964; Ph.D., Pennsylvania State University, 1967.

ORVEDAL, Ruth W., Assistant Professor of Home Management
B.S., Middle Tennessee State College, 1937; M.S., University of Tennessee, 1941.

PALUMBO, Mary S., Lecturer in Foods
B.S., University of California, 1961; M.S., University of Illinois, 1964; Ph.D., 1969.

PLEDGER, Virginia Lee, Instructor in Textiles and Consumer Economics
A.A., Graceland College, 1955; B.S., Iowa State University, 1957; M.H.E., University of Georgia, 1966.

PRATHER, Elizabeth S., Professor and Chairman, Department of Food, Nutrition and Institution Administration
B.S., Auburn University, 1951; M.S., 1955; Ph.D., Iowa State University, 1963.

RIBALTA, Pedro J., Instructor in Applied Design and Interior Design

RITZMANN, Barbara J., Instructor in Crafts and Applied Design
B.A., Pennsylvania State University, 1945; M.F.A., George Washington University, 1966.

ROPER, James B., Assistant Professor of Advertising Design
B.S., East Carolina College, 1961; M.A., 1963.

SAGER, Jane F., Lecturer in Institution Administration
B.S., Millikin University, 1961; M.S., University of Wisconsin, 1967.

SHEARER, Jane K., Professor and Chairman of Department of Housing and Applied Design
B.S., University of Tennessee, 1940; M.S., 1950; Ph.D., Florida State University, 1960.

SMITH, Betty F. Professor and Chairman, Department of Textiles and Consumer Economics
B.S., University of Arkansas, 1951; M.S., University of Tennessee, 1956; Ph.D., University of Minnesota, 1960; Ph.D., University of Minnesota, 1965.

SPIVAK, Steven M., Assistant Professor of Textiles and Consumer Economics and Chemical Engineering
B.S., Philadelphia College of Textiles and Science, 1963; M.S., Georgia Institution of Technology, 1965; Ph.D., University of Manchester, England, 1967.

WANG, Virginia L., Assistant Professor, Cooperative Extension Service
B.A., Salve Regina College, 1954; M.A., New York University, 1956; M.Ph., University of North Carolina, 1965; Ph.D., University of North Carolina, 1968.

WILBUR, June C., Assistant Professor of Textiles and Consumer Economics
B.S., University of Washington, 1936; M.S., Syracuse University, 1940.

WILLIAMS, Rhonda C., Instructor in Applied Design
B.F.A., Boston University, 1962; M.A., Montclair State College, 1968.

WILSON, Leda A., Associate Professor of Family and Community Development
B.S., Lander College, 1943; M.S., University of Tennessee, 1950; Ed.D., University of Tennessee, 1954.

ZALLEN, Eugenia M., Assistant Professor of Food and Nutrition
B.S., Auburn University, 1953; M.S., Purdue University, 1960.

ZIMMERMAN, Adele, Instructor in Applied Design and Crafts
B.A., Wellesley College, 1961; M.F.A., Alfred University, 1970.

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Physical Education, Recreation and Health

THE COLLEGE OF PHYSICAL EDUCATION, RECREATION AND HEALTH provides preparation leading to the Bachelor of Science degree in the following professional areas: physical education, health education and recreation. The college also offers curricula in safety education and elementary physical education. Moreover, in conjunction with the Graduate School and the College of Education, graduate programs leading to the master's and doctor's degrees are available in physical education, health education and recreation. The college provides a research laboratory for faculty members and graduate students who are interested in investigating the effects of exercise and various physical education activities upon the body, as well as determining methods and techniques of teaching various sports.

A one year required program of physical education and a one semester required health education program are provided by this college for all freshmen men and women of the University. The college provides an extensive intramural sports program for both men and women.

In addition to its various on-campus offerings, this college regularly conducts courses in physical education, health education and recreation in various parts of the State of Maryland and conducts workshops wherever requested by proper officials.

FACILITIES

Five separate buildings are used for the Intramural Sports Program for men, the WRA Program for women, the Professional Physical Education Program, the Health Education Program, and the Recreation Program. There is also ample outdoor space. Some of the facilities are shared with the Intercollegiate Athletic Program. A multi-million dollar facility for the college is contemplated for the very near future and ground breaking has occured.

INDOOR ACTIVITIES

STUDENT ACTIVITIES BUILDING. This building houses the offices of the Department of Intercollegiate Athletics and the College of Physical Education, Recreation and Health. It contains six activity teaching stations: the main arena, the swimming pool, the small gym, the weight training room, the wrestling room, and the judo room. In addition, there are ten classrooms, a research laboratory, a safety and driver education center, a departmental library, and a conference room.

The main arena of this building has a seating capacity of 12,004 and 19,796 sq. ft. of floor space. This arena provides facilities for class work in basketball, volleyball, badminton, bait casting, fencing and mass games and relays.

The swimming pool is divided into two areas by a permanent bulkhead. The shallow end is 42 x 24 feet and the large area is 42 x 75 feet with a depth ranging from 4 to 13 feet.

The small gymnasium is used for gymnastics, including tumbling, trampolining and all types of apparatus work. The total floor space is 9,462 sq. ft.

The weight training classroom is equipped with sufficient weights for 11 stations of three men each.

There is a wrestling room containing 8,056 sq. ft.

PREINKERT FIELD HOUSE. Preinkert Field House contains the offices for faculty in physical education and health education. There is a regulation size swimming pool, 75 x 35 feet, equipped with two one-meter diving boards. In the gymnasium, 90 x 50 feet, classes are held in badminton, volleyball, basketball, stunts and tumbling, apparatus and tennis. There are two large backboards used for indoor tennis practice. The adjacent classroom is used for professional classes. The dance studio, used for dance and fundamental of movement classes, is 40 x 60 feet.

In addition to the above areas, there are locker and shower rooms used by those enrolled in physical education and those participating in recreational activities and a small lounge for major students.

ARMORY. The Armory is used primarily for the intramural program. It houses the offices of the director of intramurals and an athletic equipment room from which students may secure equipment for recreational purposes. The 28,800 sq. ft. of floor space has four full length basketball courts, with badminton and volleyball courts superimposed on them. This facility is also used as an indoor track, with an indoor vaulting, high and broad jump pits, a one-tenth mile track, and a 70 yard straight-away.

COLISEUM. The Coliseum is used as a supplementary facility for the intramural and required program of physical education for men and women. Included in the facilities are an equipment issue room, adequate shower and locker rooms for both men and women, a classroom, and office space for several of the men's and women's physical education staff.

The 6,555 square feet of floor space is used primarily for required co-educational classes in square and social dance and for intramural basketball. In addition to the one large basketball court, however, there are five badminton and two volleyball courts available for co-ed class instruction.

NEW FACILITY

The first phase of a projected three-phase, multi-million dollar facility is currently under construction on the North campus near the Cambridge dorm complex. This initial building will have two regulation basketball courts, ten badminton courts, three volleyball courts, men and women locker rooms, and the first portion of the research laboratory. It will include some 40,000 square feet and will cost approximately 1.5 million dollars.

HEALTH EDUCATION CLASSROOM BUILDING (AA)

This building is utilized primarily by the required and health major programs. Six classrooms are available for the health programs, and most of the offices for the health faculty are located in this building.

OUTDOOR ACTIVITIES

THE STADIUM. The stadium, with a seating capacity of 33,536 has a one-quarter mile cinder track with a 220-yard straightaway. Pits are available for pole vaulting and high and broad jumping. Immediately east of the stadium are facilities for the shot put, discus and javelin throw. The College of Physical Education, Recreation and Health uses these facilities for required classes in track and field. Also east of the stadium are 13.1 acres devoted to three practice football fields, the baseball stadium, and a practice baseball, lacrosse, and soccer field. The College uses these facilities for major skill classes in football, soccer, and baseball. West of the stadium are 11.3 acres devoted entirely to physical education out-door play fields. There are four combination soccer-touch football play fields, with complete goal posts, and four softball fields with wire backstops.

Surrounding the Armory are four touch football fields and eight softball fields, encompassing 18.4 acres. These fields, plus the four in the Fraternity Row horseshoe are used exclusively for intramurals.

Immediately west of the Cole Activities Building are 14 all-weather tennis courts. A modern 18-hole golf course was opened in 1957. This 204-acre course includes two lakes, and an additional 5.8-acre golf driving range for instructional purposes. The golf driving range, equipped with lights, and the golf course greatly adds to our present recreational facilities. An outdoor playing field 300 feet by 600 feet is also provided for touch football, soccer, speedball and softball.

The outdoor facilities adjacent to the Preinkert Field House include four hard-surfaced tennis courts, and a combination hockey and lacrosse field.

RESEARCH LABORATORY

One of the important aspects of advanced study at the University of Maryland is research. To encourage research, the College of Physical Education, Recreation and Health makes available to the student a spacious, well-equipped research laboratory. Students and faculty alike are encouraged to make use of the laboratory and its facilities for the purpose of conducting their special research projects.

GENERAL INFORMATION

ENTRANCE REQUIREMENTS

All students desiring to enroll in the College of Physical Education, Recreation and Health must

apply to the director of admissions of the University of Maryland at College Park.

Sixteen units of high school credits are required for admittance to this college. *Required* high school subjects are: four units of English, one unit of social science and one unit of natural science. *Desirable* high school subjects include: algebra, plane geometry and additional natural and physical sciences, such as chemistry and physics.

Satisfactory health and physical vigor are essential for persons pursuing a career in the areas of this college.

UNDERGRADUATE PROFESSIONAL CURRICULA

GUIDANCE

At the time of matriculation and first registration, each student is assigned to a member of the faculty of the college who acts as the student's academic advisor. This faculty member will be in physical education, recreation or health education, depending on the student's choice of curriculum. The student should confer regularly with his advisor prior to and at the time of each registration.

NORMAL LOAD

The normal university load for students is 12-19 credit hours per semester. The requirements in physical education and health for men and women are fulfilled by professional courses in the college. No student may register for more than 19 hours unless he has a "B" average for the preceding semester and approval of the dean of the college.

ELECTIVES

Electives should be planned carefully, and well in advance, preferably during the orientation course the first semester, or with the student's academic advisor during the second semester. It is important to begin certain sequences as soon as possible to prevent later conflict. Electives may be selected from any department of the University in accordance with a student's professional needs. Those selected must meet with the approval of the advisor and the dean of the college.

TRANSFER STUDENTS

Only students in good standing as to scholarship and conduct are eligible to transfer into this college from another college or university. Only courses applicable to his curriculum and passed with a grade of "C" or better will be transferred. Students wishing to transfer to this college from another college of this University are subject to the general University regulations on his subject.

FRESHMAN AND SOPHOMORE PROGRAM

The work of the first two years in this college is designed to accomplish the following purposes: (1) provide a general basic or core education and prepare for later specialization by giving a foundation in certain basic sciences; (2) develop competency in those basic techniques necessary for successful participation in the professional courses of the last two years.

While much of the academic course work will be alike, the technique courses will vary considerably in the different curriculums. The technique courses must be satisfactorily completed, or competencies demonstrated before the student can be accepted for the advanced courses in methods and in student teaching. It is very important that each requirement be met as it occurs.

STUDENT TEACHING

Opportunity is provided for student teaching experience in physical education and-or health education. The student devotes eight weeks during the last semester of his senior year to observation, participation, and teaching under a qualified supervising teacher in an approved elementary, junior or senior high school or in a combined program at the elementary and secondary levels. A University supervisor from the College of Physical Education, Recreation and Health visits the student periodically and confers with both the student teacher and the cooperating teacher, giving assistance when needed.

To be eligible for student teaching, the student must (1) *have the recommendation of the University supervising teacher,* and (2) *must have fulfilled all required courses for the B.S. degree except those in the Block Student Teaching Semester except for those exceptions approved by each department.* The student must obtain a grade of "C" or better in all professional coures in his curriculum and he must register for all courses in the "Block" concurrently. Those desiring to teach at the elementary level must have successfully completed PHED 420 and must split their teaching experience into 4 hours of EDSE 374 and 4 hours of EDEL 336. Those desiring an elementary minor in physical education must also complete PHED 155, 157 and 495.

FIELD WORK

Recreation major students are expected to carry out a number of field experiences during their University career; volunteer or part-time recreation employment during the school year, summer employment in camps or at playgrounds, etc. These experiences culminate in a senior semester of field work for which a student receives credit and during which the student works as a staff member (for 20 hours per week) in the field of recreation in which he or she hopes to be employed, such as public recreation, recreation for

the exceptional agencies (Y's, Scouts, etc.), military recreation, etc.

DEGREES

The degree of Bachelor of Science is conferred upon students who have met the conditions of their curricula as herein prescribed by the College of Physical Education, Recreation and Health.

Each candidate for a degree must file a formal application with the Registrations Office during the registration period, or not later than the end of the third week of clases of the regular semester, or at the end of the second week of the summer session, prior to the date of graduation.

CERTIFICATION

The Maryland State Department of Education certifies for teaching only when an applicant has a tentative appointment to teach in a Maryland county school. No certificate may be secured by application of the student on graduation. Course content requirements for certification are indicated with each curriculum. Certification is specifically limited to graduates who "rank academically in the upper four-fifths of the class and who make a grade of 'C' or better in student teaching." In order to insure the meeting of these requirements, students will not be approved for student teaching except as indicated above. A student intending to qualify as a teacher in Baltimore, Washington or other specific situations should secure a statement of certification requirements before starting work in the junior year and discuss them with his academic advisor.

STUDENT ORGANIZATIONS

MAJORS' CLUB: All students enrolled in the college are eligible for membership in this organization. It conducts various professional meetings, brings in speakers and promotes various corecreational activities. It has sponsored trips to district and national conventions of the American Association for Health, Physical Education and Recreation, and is chartered as a student major club of that organization.

AQUALINERS: This synchronized swimming club is open to all men and women registered in the University. Through weekly meetings the group concentrates on additionai stroke perfection, individual and group stunts, diving, and experimentation with various types of accompaniment and choreographic techniques. An original water show is presented each spring and several demonstrations are given each year. Tryouts are held twice a year—once at the beginning of the fall semester, and again after the water show during the spring semester.

UNIVERSITY OF MARYLAND RECREATION AND PARKS SOCIETY: In the fall of 1959 the University of Maryland Recreation and Parks Society was formed by the undergraduate and graduate major and minor students of the college. The society, an affiliate of the state and national recreation organizations, provides opportunities for university and community service, for rich practical experience, and for social experiences for those students having a mutual professional recreation interest.

GYMKANA TROUPES: The Gymkana Troupe includes men and women students from all colleges who wish to express themselves through the medium of gymnastics. These individuals coordinate their talents in order to produce an exhibitional performance that has been seen in many places including Bermuda, Iceland, Azores, Idaho, Montana, and the eastern seaboard of the United States. The organization has three principal objectives: (1) to provide healthful, co-recreational activities that provide fun for the students during their leisure hours; (2) to promote gymnastics in this locality; and (3) to entertain our students and people in other communities.

This organization is co-sponsored by the Physical Education Department and the Student Government Association, and it welcomes any student, regardless of the amount of experience, to join.

INTRAMURALS FOR MEN: The Intramural Department offers an extensive opportunity for all men to participate in a recreational program of either individual or team sports. A variety of activities are available to fill the student's leisure time and develop skills which may be carried over into later life. Also, many desirable attributes, such as fair play, leadership, teamwork, and sportsmanship, are encouraged and developed by the student participating in the program.

Leagues and tournaments are conducted in the following sports: touch football, horseshoe pitching, tennis, cross country, track and field, basketball, table tennis, badminton, boxing, wrestling, bowling, volleyball, swimming, foul shooting, and softball.

Management and officiating in intramural sports are conducted by students majoring in physical education under the supervision of the director of intramurals and under policies and regulations established by the Intramural Council.

WEIGHT LIFTING CLUB: The University of Maryland Weight Lifting Club is open to all students and faculty for exercise with the weights throughout the week during all hours that Cole Student Activities Building is open.

The University of Maryland Olympic Barbell Club is a more highly organized group of the original club. It is recognized by the Student Government Association. Bi-monthly meetings are held which assist in leadership, offer clinics and demonstrations, etc.; participate in competition, and earn awards of recognition.

WOMEN'S RECREATION ASSOCIATION: *All women students of the University are members of the*

Women's Recreation Association, an affiliate of the Athletic and Recreational Federation of College Women. Under the leadership of its elected student officers and representatives and appointed sports managers, the WRA sponsors a full program of intramural, extramural and interest group activities. These activities seek to develop new interests and skills for leisure-time enjoyment, provide opportunities for continuing both old and new interests, and provide a democratic atmosphere for educational leadership experiences. Included are free and tournament play in archery, badminton, basketball, bowling, fencing, field hockey, golf, softball, swimming, table tennis, and volleyball; social events; and co-recreational activities in bowling, badminton, and volleyball. Intramural tournaments are organized through the dormitory, sorority, and "day dodger" groups of the University. Sports Days and Play Days with other colleges and universities enable the more skilled students to participate with others of similar abilities. Opportunities are also provided for officiating experience and for the earning of official WNORC ratings in basketball, field hockey, swimming, and volleyball.

Various special groups and clubs interested in recreation exist on campus outside the Women's Recreation Association program and offer rich opportunities for the development of ther recreational interest. Some of these are the Terrapin Trail Club, Chess Club, Gymkana Troupe, Sailing Club, Ski Club, and musical and dramatic groups.

PHI ALPHA EPSILON: Honorary Society of the College of Physical Education, Recreation and Health.

The purpose of this organization is to recognize academic achievement and to promote professional growth by sponsoring activities in the fields of physical education, recreation, health and related areas.

Students shall qualify for membership at such time as they shall have attained junior standing in physical education, health or recreation, and have a minimum overall average of 2.7 and a minimum professional average of 3.1. Graduate students are invited to join after 10 hours of work with a 3.3 average. The organization is open to both men and women.

SIGMA TAP EPSILON: This society, founded in 1940, selects those girls who have attained an overall 2.5 average and demonstrated outstanding leadership, service and sportsmanship like qualities in the organization and activities of the Women's Recreation Association and its affiliated groups.

ETA SIGMA GAMMA: Epsilon chapter was established at the University of Maryland in May of 1969. This professional honorary organization for health educators was established to promote scholarship and community service for health majors at both the graduate and undergraduate levels. Students may apply after two consecutive semesters with a 2.75 cumulative average.

PROFESSIONAL CURRICULA

PHYSICAL EDUCATION

This curriculum prepares students (1) for teaching physical education in the secondary school (2) for coaching and (3) for leadership in youth and adult groups which offer a program of physical activity. The first two years of this curriculum are considered to be an orientation period in which the student has an opportunity to gain an adequate background in general education as well as in those scientific areas closely related to this field of specialization. In addition, emphasis is placed upon the development of skills in a wide range of motor activities. Further, students are encouraged to select related areas, especially in the fields of biology, social science, psychology, health education, and recreation as fields of secondary interest. These materially increase the vocational opportunities which are available to a graduate in physical education.

EQUIPMENT: Students may be required to provide individual equipment for certain courses.

UNIFORMS: Suitable uniforms, as prescribed by the College, are required for the activity classes and for student teaching. These uniforms should be worn only during professional activities.

Men—During the freshman and sophomore years, men will wear red and black T-shirts, black trunks, white socks, gym shoes, supporter, and sweat suit.

Women—Appropriate uniforms, ankle socks, and tennis shoes, and leotard and skirt, and warm-up suit.

For Student Teaching—an appropriate teaching costume will be selected under the guidance of the supervisor of student teaching before the beginning of the junior year.

PHYSICAL EDUCATION CURRICULUM FOR MEN

	Semester I	Semester II
Freshman Year		
ENGL 101—Composition	3	..
Social Science Elective	..	3
MATH (any above Math 001)	3	..
ZOOL 101—General Zoology	..	4
SPCH 107—Public Speaking	2	..
HLTH 140—Personal and Community Health	..	3
PHED 130—Introduction to Physical Education and Health	2	..
PHED 150—Rhythmic Activities	2	..
PHED 161M, 163M—Skills Laboratory	2	2
PHED 263M—Aquatics	..	2
Electives	3	3
Total	17	17
Sophomore Year		
ENGL 201, 202—World Literature	3	3
ZOOL 201, 202—Human Anatomy and Physiology	4	4
Social Science Elective	3	..
PHED 261M, 263M—Laboratory Skills	2	2
HIST 221 or 222—U.S. History	..	3
Science Group Requirement (Physics or Chemistry)	..	4

HLTH 150—First Aid and Safety	1	..
Electives	4	1
Total	17	17
Junior Year		
HIST	3	..
Fine Arts elective	..	3
PHED 400—Kinesiology	4	..
PHED 305M, 307M—Skills Laboratory	2	2
PHED 314—Methods, Curriculum and Observation for Secondary Schools	4	..
PHED 420—Physical Education for the Elementary School	..	3
Theory of Coaching elective (PHED 323, 325 or 326)	2	..
PHED 480—Measurement in Physical Education and Health	..	3
EDUC 300—Human Development and Learning	..	6
Electives	2	..
Total	17	17

	Semester I	Semester II
Senior Year		
EDUC 301—Foundations of Education	3	..
PHED 333—Adapted Physical Education	2	..
EDSE 330—Principles and Methods of Secondary Education	..	3
EDSE 374—Student Teaching in Secondary Schools	..	8
PHED 460—Theory of Exercise	3	..
PHED 381—Advanced Training and Conditioning	3	..
PHED 490—Organizations and Administration of Physical Education	..	3
PHED 493—History and Philosophy of Sport and Physical Education	..	3
Electives	6	..
Total	17	17

PHYSICAL EDUCATION CURRICULUM FOR WOMEN

	Semester I	Semester II
Freshman Year		
ENGL 101, 201—Composition and Literature	3	3
Social Science Elective	..	3
ZOOL 101—General Zoology	4	..
SPCH 107—Public Speaking	2	..
MATH 105 or 110 (any above MATH 001)	..	3
PHED 130—Introduction to Physical Education and Health	2	..
PHED 140W—Fundamentals of Movement	2	..
PHED 150—Rhythmic Activities	2	..
DANC 100—Dance Techniques	..	2
PHED 162W, 164W—Skills Laboratory	2	2
HLTH 140—Personal and Community Health	..	3
Electives	..	1
Total	17	17
Sophomore Year		
ENGL 202—World Literature	3	..
ZOOL 201, 202—Human Anatomy and Physiology	4	4
Social Science Elective	3	..
HIST 221 or 222—U.S. History	..	3
Science Group Requirement (Physics or Chemistry	..	4
HLTH 150—First Aid and Safety	1	..
PHED 262W, 264W—Skills Laboratory	2	2
PHED 274W—Aquatics	..	2
PHED 282W—Organization and Administration of Intramurals	1	..
Electives	3	2
Total	17	17
Junior Year		
Fine Arts Elective	..	3
History	..	3
PHED 400—Kinesiology	4	..
PHED 305W, 307W—Laboratory Skills	2	2
EDUC 300—Human Development and Learning	6	..
PHED 314—Methods in Physical Education in Secondary Schools	4	..
PHED 420—Physical Education for the Elementary Schools	..	3
PHED 324W—Theory of Coaching	..	2
PHED 480—Measurement in Physical Education and Health	..	3
Electives	1	1
Total	17	17
Senior Year		
EDUC 301—Foundations of Education	3	..
EDUC 330—Principles and Methods of Secondary Education	..	3
EDSE 374—Student Teaching in Secondary Schools	..	8
PHED 333—Adapted Physical Education	2	..
PHED 460—Theory of Exercise	3	..
PHED 490—Organization and Administration of Physical Education	..	3
PHED 493—History and Philosophy of Sports and Physical Education	..	3
Electives	9	..
Total	17	17

REQUIREMENTS FOR DEGREE IN PHYSICAL EDUCATION

Requirements for the Bachelor of Science degree in physical education in the College of Physical Education, Recreation and Health are as follows:

Men	Sem. Cr.
Professional Physical Education Courses PHED 130, 150, 161M, 163M, 261M, 263M, 274M, 400, 305M, 307M, 314, 420, (323 or 325 or 326), 333, 460, 480, 381, 490, 493	48
Foundation Science courses as presented ZOOL 101, 201, 202; PHYS 111 or CHEM 102	16
Education courses as prescribed	20
General Education Requirements ENG 101, 201, 202; Fine Arts; HIST, MATH 105 or 110; Soc. Sc.; Science, as shown above	27
Specially prescribed requirements (SPCH 107)	2
Health courses as prescribed (HLTH 140, 150)	4
Electives	19
Total	136

Women	Sem. Cr.
Professional Physical Education Courses PHED 130, 140W, 150, 162W, 164W, 262W, 264W, 274W, 282W, 400, 305W, 307W, 314, 420, 324W, 460, 480, 490, 493, DANC 100	49
Foundation Science courses as prescribed ZOOL 101, 201; PHYS 111 or CHEM 102	16
Education courses as prescribed	20
General Education Requirements ENGL 101, 201, 202; Fine Arts 3 hrs.; MATH 105 or 110; Soc. Sc. 6 hours; Science, as shown above	27
Specially prescribed requirements (SPCH 107)	27
Health courses as prescribed (HLTH 140, 150)	4
Electives	18
Total	136

MINOR IN PHYSICAL EDUCATION

20 semester hours in physical education and 4 semester hours in cognate areas.

REQUIRED COURSES

Men—PHED 130; 161M, 163M, 261M, 263M (2-6); 314; 323, 325 or 326.

Women—PHED 130; 162W, 164W, 262W, 264W (2-6); 314; 324W.

ELECTIVE COURSES

Men and Women—PHED 265W, 276W, 400, 333, 460, 480, 381, 485, 487, 490, 493.

If planning to teach, the cognate courses for men should be HLTH 140 and HLTH 150; for women, HLTH 150 and HLTH 420.

Note: To be certified to teach in Maryland, 30 semester hours are required in physical education in addition to the following or equivalent, ZOOL 101, 201, 202 and chemistry or physics.

There are two plans for a minor in elementary school physical education. Plan A is for students in the College of Physical Education, Recreation and Heath, and Plan B is for students outside the College of Physical Education, Recreation and Health.

1. Plan A. (for students in this college)
   10 semester hours in elementary school physical education courses and 10 hours in cognate areas.

Required Courses

PHED 155, 157, 420, 495.

Elective Courses

10 hours in any of the following cognate areas: human development, elementary education, biological science, health education. (Not more than 6 hours shall be taken in any one cognate area.)

Student Teaching

Students will be required to do four weeks of their eight weeks student teaching at the elementary school level in physical education.

II. Plan B. (for students outside this college)
   13 semester hours in elementary school physical education courses and 10 hours in cognate areas.

Required Courses

PHED 155, 157, 330, 420, 495.

Elective Courses

10 hours in any of the following cognate areas: human development, elementary education, biological science, health education. (Note more than six hours shall be taken in any one cognate area.)

HONORS PROGRAM

THE HONORS PROGRAM IN PHYSICAL EDUCATION

The aim of the Honors Program is to encourage superior students by providing an enriched program of studies which will fulfill their advanced interests and needs. Qualified students are given the opportunity to undertake intensive and often independent studies wherein initiative, responsibility and intellectual discipline are fostered. To qualify for admission to the program:

1. A freshman must have a "B" average in academic (college Prep) curriculum of an accredited high school.
2. A sophomore must have an accumulative GPA of 3.00 in all college courses of official registration.
3. All applicants must have three formal recommendations concerning their potential, character, and other related matters.
4. All applicants must be accepted by the Faculty Honors Committee.

In completing the program, all honors students must:

1. Participate in an honors seminar where thesis and other relevant research topics are studied.
2. Pass a comprehensive oral examination covering subject matter background.
3. Successfully prepare and defend the honors thesis.

On the basis of the student's performance in the above program, the college may vote to recommend graduation without honors, with honors, or with high honors.

FACULTY

Professors: Clarke, Eyler, Fraley, Humphrey, Husman.

Associate Professors: Church, Cronin, Kelley, Kramer, Steel, Stull.

Assistant Professors: Arrighi, Campbell, Freundschuh, Hult, Ingram, Jackson, Johnson, Kesler, Krouse, Love, McKnight, Santa Maria, Tyler, VanderVelden, Wrenn.

Instructors: Beardmore, Crowson, Drum, Fringer, Kurrie, Murray, Royer, Roys, Sigler, Terauds.

PHED 130 (30). INTRODUCTION TO PHYSICAL EDUCATION. (2)
First and second semesters. An orientation to the profession, including the relationship of physical education to education, current trends and practices, career opportunities, and areas of research. (Staff)

PHED 140W (40W). FUNDAMENTALS OF MOVEMENT. (2)
First and second semesters. Three hours a week. Introduction to analysis of muscular activity; conditioning exercises and programs; improvement of physical fitness; and analysis of the relationship of mechanical principles to basic movement and skills. (Staff)

PHED 150 (50). RHYTHMIC ACTIVITIES. (2)
First and second semesters. Six hours a week. Development of rhythmic sensitivity through analysis of rhythm and its application to movement, skills in folk, square and social dance, teaching techniques for use in schools and recreational programs. (Staff)

PHED 155 (55). ELEMENTARY SCHOOL RHYTHMIC ACTIVITIES. (2)
First and second semesters and summer. A survey of the various types of rhythmic activities suitable for use in the elementary school. Basic rhythms, singing games, and folk and square dancing are considered. (Staff)

PHED 157 (57). ELEMENTARY SCHOOL SKILLS AND SELF-TESTING ACTIVITIES. (2)
First and second semesters and summer. A survey of the various types of skills, stunts, and tumbling activities suitable for use in the elementary school. (Staff)

PHED 161M, 163M (61m, 63m). SKILLS LABORATORY. (2, 2)
First and second semesters, respectively. Six hours a week. Progressive techniques and practice of skills in selected team and individual sports as apparatus, soccer, track and field, and tumbling and trampolining. (Staff)

PHED 162W, 164W (62w, 64w). SKILLS LABORATORY. (2, 2)
First and second semesters respectively. Six hours a week. Progressive techniques, knowledges and practice of selected team and individual sports as field hockey, basketball, volleyball, and track and field. (Staff)

PHED 171 WM (71). ELEMENTARY SWIMMING. (1)
First and second semesters. Progressive techniques and practice of elementary swimming including basic and intermediate swimming instruction. (Staff)

PHED 172W (72w). ELEMENTARY SWIMMING AND DIVING. (1)
First and second semesters. Three hours a week. Progressive techniques and practice in the elementary phase of swimming and diving, designed to make the student self-sufficient in deep water. (Staff)

PHED 261M, 263M (65m, 67m). SKILLS LABORATORY. (2, 2)
First and second semesters respectively. Six hours a week. Progressive techniques and practice of skills in selected team and individual sports as football, wrestling, basketball, and baseball. (Staff)

PHED 262W, 264W (66w, 68w). SKILLS LABORATORY. (2, 2)
First and second semesters respectively. Six hours a week. Techniques, knowledge and practice of selected team and individual sports as softball, field games, stunts and tumbling, apparatus, and tennis. (Staff)

PHED 265WM (69). SKILLS LABORATORY. (2)
First and second semesters. Three hours a week. Prerequisite: PHED 161M or 162W. Complex gymnastic activities above the elementary phase. (Staff)

PHED 270W (74w). INTERMEDIATE SWIMMING AND DIVING. (1)
First and second semesters. Three hours a week. Prerequisite. PHED 172W or equivalent. Progressive techniques and practice of skills in swimming and diving. (Staff)

PHED 271M (73). ADVANCED SWIMMING. (1)
First and second semesters. Prerequisite: PHED 171M or equivalent. Progressive techniques and practice of advanced swimming skills, water stunts and survival swimming. (Staff)

PHED 272W (76w). ADVANCED SWIMMING AND LIFE SAVING. (1)
First and second semesters. Three hours a week. Prerequisite: PHED 270W. American Red Cross Senior Life Saving, advanced swimming, and diving are included. (Staff)

PHED 273M (75). LIFE SAVING AND WATER SAFETY. (1)
First and second semesters. Three hours a week. Prerequisite: PHED 271M or equivalent. Progressive techniques and practice of life saving and water safety skills. Course includes the Senior Life Saving material of the American Red Cross and the Y.M.C.A. (Staff)

PHED 274M (77m). METHODS OF AQUATICS. (2)
First and second semesters. Three hours a week. Prerequisite: PHED 271M or equivalent. Training for aquatic leadership in schools, camps and clubs. Included are teaching methods, administration, facilities, and equipment. (Staff)

PHED 274W (77w). METHODS OF AQUATICS. (2)
First and second semesters. Three hours a week. Prerequisite. PHED 172W or equivalent. Training for aquatic leadership in schools, camps and clubs. Included are teaching methods, organization and administration, analysis of competitive swimming, synchronized swimming, diving, and equipment and pool maintenance. (Staff)

PHED 276W (78w). WATER SAFETY. (1)
Second semester. Three hours a week. Prerequisite: Current American Red Cross Senior Life Saving certificate. Principles and techniques of teaching swimming and life saving. (Staff)

PHED 277M (79). FANCY DIVING. (1)
First and second semesters. Three hours a week. Progressive techniques and practice of fancy diving. Course will include work on the five categories of dives. (Staff)

PHED 282W (82w). ORGANIZATION AND ADMINISTRATION OF INTRAMURALS. (1)
First and second semesters. Three hours a week. Organization and administration of intramural programs and tournaments and techniques of officiating women's sports. Opportunity to qualify for officials' ratings in hockey and basketball. (Staff)

FOR ADVANCED UNDERGRADUATES

PHED 301, 303 (101, 103). ORGANIZATION AND OFFICIATING IN INTRAMURALS. (1, 1)
First and second semesters, respectively. Organization, administration, and promotion of intramurals at various school levels. Included are types of tournaments, units of competition, handling of student leader personnel. (Staff)

PHED 305W, 307W (105w, 107w). SKILLS LABORATORY. (2, 2)
First and second semesters, respectively. Four hours a week. Knowledge, techniques and practice in selected team, individual and dual sports. (Staff)

PHED 305M, 307M (105m, 107m). SKILLS LABORATORY. (2, 2)
First and second semesters, respectively. Four hours a week. Experience in individual and dual motor skills. (Staff)

PHED 314 (114). METHODS IN PHYSICAL EDUCATION FOR SECONDARY SCHOOLS. (4)
First and second semesters. Three lectures and a lab. each week. Application of educational philosophy and principles to class organization and techniques of teaching physical education in the junior and senior high schools. (Staff)

PHED 323, 325, 326 (123, 125, 126). COACHING ATHLETICS. (2, 2, 2)
First and second semesters. Two lecture hours a week. Theory of coaching the various competitive sports commonly found in high school and college programs. (Staff)

PHED 324W (124w). COACHING ATHLETICS. (2)
First and second semesters. Three hours a week. General theory and psychology of coaching; theory and practice of coaching selected competitive sports found in the secondary schools and community recreation programs. (Staff)

PHED 330 (130). FUNDAMENTALS OF BODY DYNAMICS. (3)
First and second semesters and summer. Acquaintance of the elementary teacher with the scientific principles of mechanical-anatomical analysis and physiology of activities relating to physical growth and development. (Staff)

PHED 333 (133). ADAPTED PHYSICAL EDUCATION. (2)
First and second semesters. Lecture and lab. Prerequisite: PHED 400 or equivalent. Application of kinesiological and physiological principles to handicapped students; designed to help prospective teachers meet exercise needs of those pupils with disabilities. (Staff)

PHED 335 (135). COACHING SWIMMING AND DIVING. (2)
First and second semesters. Three hours a week. Analysis of the techniques of coaching swimming and diving. Included is a systematic treatment of the philosophy, historical development and psychological theories of coaching aquatics. (Staff)

PHED 381 (181). ADVANCED TRAINING AND CONDITIONING. (3)
First and second semesters. Three hours a week. Prerequisite: PHED 400. Theoretical and practical foundations of the prevention, recognition and treatment of athletic injuries. Physical conditioning and re-conditioning, preventive taping, first aid, and various modalities are emphasized. (Staff)

PHED 398H (198H). HONORS SEMINAR. (1)
First and second semesters. Prerequisite: Participation in honors program. One discussion period a week. Guided discussion of research topics of current interest. Repeatable to a total of 3 hours credit. (Staff)

PHED 399H (199H). HONORS THESIS. (3)
First and second semesters. Prerequisites: PHED 398H and candidacy for honors in Physical Education. Advisement will be on an individual basis. Thesis must be defended in the Honors Seminar. (Staff)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

PHED 400 (100). KINESIOLOGY. (4)*
First and second semesters and summer. Three lectures and two laboratory hours a week. Prerequisites: ZOOL 1, 14, and 15, or the equivalent. The study of human movement and the physical and physiological principles upon which it depends. Body mechanics, posture, motor efficiency, sports, the performance of atypical individuals, and the influence of growth and development upon motor performance are studied. (Staff)

PHED 420 (120). PHYSICAL EDUCATION FOR THE ELEMENTARY SCHOOL. (3)*
First and second semesters and summer. Orientation of the general elementary teacher to physical education. Principles and practices in elementary physical education are discussed and a variety of appropriate activities are considered. (Staff)

PHED 455 (155). PHYSICAL FITNESS OF THE INDIVIDUAL. (3)*
First and second semesters and summer. A study of the major physical fitness problems confronting the adult modern society. Consideration is given to the scientific appraisal, development, and maintenance of fitness at all age levels. Such problems as obesity, weight reduction, chronic fatigue, posture, and special exercise programs are explored. Open to persons outside the professions of physical education. (Staff)

PHED 460 (160). PHYSIOLOGY OF EXERCISE. (3)*
First and second semesters and summer. Two lectures and two laboratory hours a week. Prerequisites: ZOOL 101, 201 and 202; PHED 400 or equivalent. A study of the physiology of exercise, including concepts of work, muscular contraction, energy transformation, metabolism, oxygen debt, and nutrition and athletic performance. Emphasis is placed on cardiovascular and respiratory function in relation to physical activity and training. (Staff)

PHED 470 (170). SUPERVISION IN ELEMENTARY SCHOOL PHYSICAL EDUCATION. (3)*
First and second semesters and summer. Prerequisite: PHED 420. Principles and techniques of supervision are studied for improving the learning situation in elementary school physical education. (Staff)

PHED 480 (180). MEASUREMENT IN PHYSICAL EDUCATION. (3)*
First and second semesters and summer. Two lectures and two laboratory periods a week. Prerequisite: MATH 105 or 110. A study of the principles and techniques of educational measurement as applied to teaching of physical education; study of the functions and techniques of measurement in the evaluation of student progress toward the objectives of physical education and in the evaluation of the effectiveness of teaching. (Staff)

PHED 485 (185). MOTOR LEARNING AND SKILLED PERFORMANCE. (3)*
First and second semesters and summer. Prerequisites: PSYC 100 and PHED 480. A study of the research dealing with motor learning and motor performance. Major topics discussed are scientific methodology, individual differences, specificity, proprioceptive control of movement, motivation, timing, transfer, and retention. (Staff)

PHED 487 (187). PHYSICAL EDUCATION AND SPORT IN CONTEMPORARY CULTURES. (3)*
First and second semesters. Three lectures a week. Prerequisite: SOCY 100 or equivalent. A study of the cultural impact of physical education activities in the United States and selected countries. Individual research on selected topics is required. (Staff)

PHED 489 (189). FIELD LABORATORY PROJECTS AND WORKSHOP. (1-6)*
First and second semesters and summer. Workshops and research projects in special areas of knowledge not covered by regularly structured courses. Note: The maximum total number of credits that may be earned toward any degree in physical education is six. (Staff)

PHED 490 (190). ORGANIZATION AND ADMINISTRATION OF PHYSICAL EDUCATION. (3)*
First and second semesters. The application of the principles of administration and supervision to physical education. Students are normally enrolled during the student teaching semester. (Staff)

PHED 491 (191). THE CURRICULUM IN ELEMENTARY SCHOOL PHYSICAL EDUCATION. (3)*
First and second semesters. Techniques planning and construction are considered from a standpoint of valid criteria for the selection of content in elementary school physical education. Desirable features of cooperative curriculum planning in providing for learning experiences will be presented and discussed. (Staff)

PHED 493 (193). HISTORY AND PHILOSOPHY OF SPORT AND PHYSICAL EDUCATION. (3)*
First and second semesters. History and philosophical implications of sport and physical education through ancient, medieval, and contemporary periods in western civilization. Students are normally enrolled during the student teaching semester. (Staff)

PHED 495 (195). ORGANIZATION AND ADMINISTRATION OF ELEMENTARY SCHOOL PHYSICAL EDUCATION. (3)*
First and second semesters and summer. Prerequisite: PHED 420. A study of the procedures basic to the satisfactory organization of all phases of the elementary school physical education program. Emphasis is placed on the organizational and administrative factors necessary for the successful operation of the program in various types of elementary schools. (Staff)

PHED 496 (196). QUANTITATIVE METHODS. (3)*
First and second semesters and summer. Statistical techniques most frequently used in research pertaining to physical education. Effort is made to provide the student with the necessary skills, and to acquaint him with the interpretations and applications of these techniques. (Staff)

FOR GRADUATES

See the *Graduate School Catalog* for descriptions.

PHED 600 (200). SEMINAR IN PHYSICAL EDUCATION. (1)
PHED 602 (202). STATUS AND TRENDS IN ELEMENTARY SCHOOL PHYSICAL EDUCATION. (3)
PHED 604 (204). PHYSICAL EDUCATION AND THE DEVELOPMENT OF THE CHILD. (3)
PHED 610 (210). METHODS AND TECHNIQUES OF RESEARCH. (3)
PHED 612 (230). RESEARCH LITERATURE. (3)
PHED 615 (215). PRINCIPLES AND TECHNIQUES OF EVALUATION. (3)
PHED 620 (205). ANALYSIS OF CONTEMPORARY ATHLETICS. (3)
PHED 630 (286). SOCIOLOGY OF SPORT. (3)
PHED 640 (203). SUPERVISORY TECHNIQUES IN PHYSICAL EDUCATION. (3)
PHED 642 (290). ADMINISTRATIVE DIRECTION OF PHYSICAL EDUCATION. (3)

PHED 644 (291). CURRICULUM CONSTRUCTION IN PHYSICAL EDUCATION. (3)
PHED 650 (250). MENTAL AND EMOTIONAL ASPECTS OF SPORTS AND RECREATION (3)
PHED 660 (201). PHILOSOPHY OF PHYSICAL EDUCATION. (3)
PHED 662, 663 (206, 207). HISTORY OF SPORT IN WESTERN CULTURE (3, 3)
PHED 688 (285) SEMINAR IN PERCEPTUAL SKILL, MOTOR LEARNING AND PERFORMANCE. (3)
PHED 689 (288). SPECIAL PROBLEMS IN PHYSICAL EDUCATION (1-6)
PHED 690 (280). SCIENTIFIC BASES OF EXERCISE. (3)
PHED 775 (275). ADVANCED ANALYSIS OF HUMAN MOTION. (3)
PHED 789 (287). ADVANCED SEMINAR. (1-3)
PHED 799 (399). RESEARCH THESIS. (1-5)
PHED 899 (499) RESEARCH DISSERTATION. (1-5)

*These courses may be taken for graduate credit with the permission of the adviser. Students taking 400 level courses for graduate credit will be expected to carry out a special research project

REQUIREMENTS IN PHYSICAL EDUCATION

In the "General and Academic Regulations" the basic requirements in physical education for men and women are stated under the section entitled "Physical Education" as follows:

"All undergraduate men and women students who are registered for more than eight semester hours of credit are required to enroll in and successfully complete two prescribed courses in physical education. The successful completion of these courses is required for graduation. These courses must be taken by all eligible students during the first two semesters of attendance at the University, whether or not they intend to pursue a degree. Men and women who have reached their thirtieth birthday are exempt from these courses. The thirtieth birthday must precede the Saturday of registration week. Students who are physically disqualified from taking these courses must enroll in adaptive courses for which credit will be given."

A student who has 56 transferred academic credits will not be required to register for physical education. Students with one calendar year of full-time active military service may receive credit for these courses by applying to the director of the Men's Physical Education Program.

Students majoring or minoring in physical education, recreation or health education may meet these requirements by enrolling in special professional courses.

The program of physical education offers the college student an opportunity to acquire skills, knowledges and appreciations in a variety of physical and sports activities. Adequate participation now and in the future will contribute to more efficient physiological functioning, effective movement, improved human relations, and worthwhile use of leisure time. Students are urged to develop new skills as well as to select those in which they would like to have further experience.

The complete course offering for any one semester is listed in the "Schedule of Classes" for each semester. Special attention should be given to the time, place, and section of the activities. When selecting course for credit, consideration should be given to the following points:

Male Students: All male students are required to take the basic program, PHED 001, Basic Physical Education, the first semester in which they are enrolled in the University.

Each male student enrolled in required physical education will be furnished a red and black reversible T-shirt, black trunks, socks, supporter, and towel. Gymnasium shoes, and for some classes, sweat clothes must be furnished by the student.

At the end of each semester or upon withdrawal from the University each student must return his clothing to the equipment custodian or he will be billed for all items of clothing which are missing.

Women Students: All women students will select the activity in which they would like to participate. UNIFORM: Each woman student is expected to provide herself with gymnasium costume consisting of dark green bermuda shorts, white blouse, white socks and tennis shoes.

The Basic Program Courses are designated as:

PHED 001—Basic Physical Education—Men
PHED 002—Basic Physical Education—Women
PHED 003-039—Physical Education Activities—Men
PHED 040-078—Physical Education Activities—Women
PHED 079—Adapted Physical Education—Coed
PHED 080-097—Physical Education Activities—Coed
PHED 098—Athletic Physical Education Activities

(The PHED Basic Courses listed above may be taken for credit beyond requirement or for Audit)

RECREATION

The increased amount of leisure time existent in our society because of the rapid development of modern civilization, and the imperative need for guidance in the wise use of that leisure time, has made society cognizant of the need for trained recreation leaders.

This curriculum, therefore, is designed to meet the needs of students who wish to qualify for the many positions in the field of recreation, and the needs of those students who desire a background in skills which will enable them to render distinct contributions to community life. The College draws upon various other departments and colleges within the University for courses to balance and enrich its offerings for its recreation curriculum.

Those majoring in recreation have opportunity for observation and practical experience in local, county, state, and federal public recreation programs, in social and group work agency programs, and in the various programs of the Armed Forces, American Red Cross, local hospitals, etc. Major students are encouraged to select an 'op-

tion' area of interest around which to center their elective courses (for instance: public recreation, recreation for the ill and handicapped, and outdoor recreation.)

A very active student University of Maryland Recreation and Parks Society, an affiliate of the comparable state and national organizations, exercises degrees of leadership in selecting the annual "outstanding senior" and "outstanding alumnus" awards, in the granting of the various city, county and state society recreation scholarships, in the programming of the annual 'Governor's Conference on Recreation,' etc. It also provides opportunities for university and community service, for rich practical experience, and for social experiences for those students having a mutual professional recreation interest.

REQUIREMENTS FOR DEGREE IN RECREATION

Requirements for the Bachelor of Science degree in recreation in the College of Physical Education, Recreation and Health are as follows:

College recreation courses (RECR 130, 150 or 450, 220, 221, 420, 349, 460, 495, 490)	25-26
Prescribed courses in related areas (PhEd 150; 161-164, 261-265; 314; APDS 101; CRFT 102; MUSC 155; SOCY 100, 330; SPCH 100, 220; DART 311 or 440; PSYC 100; EDHD 306)	39
Additional prescribed courses in one recreation option area (public recreation, recreation for the ill and handicapped or outdoor recreation)	12
Prescribed health course (HLTH 140, 150)	4
Additional General Education requirements (ENGL 9 cr.; HIST 6 cr.; Fine Arts 3 cr.; Science 7 or 8 cr.; MATH 3 cr.)	28-29
Electives (to encourage proficiency in one skill area or provide for a minor)	22
Total	130

MINOR IN RECREATION

18 semester hours in recreation and 6 semester hours in cognate areas, including in the 18 hours the following:

10 hours in RECR 130, 150, 221, 420, 450, 325, 460, 495 or 490; SOCY 330; RECR 220.

6 hours of work in areas of the recreational skills—nature, arts and crafts, speech and dramatics—but *not* in the area of the student's major.

2 hours of work in the areas of swimming, sports and dance skills.

OR other courses approved by the student's adviser and the various departments involved, depending upon the student's interest and background.

Elective courses (6 hours) are selected with the approval of the student's advisor.

FACULTY

Professor: Harvey.
Associate Professors: Churchill, Strobell.
Assistant Professor: Leedy.
Visiting Instructors: Bushart, Hutchison, Stevenson, Hawkins, Jarrell, Sperling.

RECR 130 (30). HISTORY AND INTRODUCTION TO RECREATION. (2)
First and second semesters. An introduction to the beginnings, growth, and possibilities in recreation as presently conducted by individuals, agencies and governments; attitudes toward and theories of play; historical events and figures; organizations and groups interested in recreation, including their job opportunities, specifications and demands; a self analysis of individual student interests, limitations and capabilities in light of these specifications and demands. (Staff)

RECR 150 (40). CAMP COUNSELING AND ADMINISTRATION. (2)
First and second semesters. A study of the philosophy and techniques of camp counseling including the qualications, responsibilities and skills involved; the basic organization, administration and program planning practices and problems of camping as a whole; the relationship of these practices and problems to the counselor and his or her probable success. Outdoor skills will be taught and practiced insofar as possible with field trips included. (Staff)

FOR ADVANCED UNDERGRADUATES

RECR 220 (100). CO-RECREATIONAL GAMES AND PROGRAMS. (2)
First and second semesters. Compilation and sampling of the techniques for use in low organization and party games and activities. Emphasis is placed upon those activities of value to a recreation leader or teacher, and upon the placement, sequence and variation of such activities for all age levels and interests. (Strobell)

RECR 221 (110). NATURE LORE. (2)
Second semester. An overall orientation course in nature interpretation covering, from a recreational point of view, the various areas of the physical and biological sciences. Students will be required to attend evening classes, carry out various observations and participate in practice-leadership experiences as scheduled. (Staff)

RECR 325 (170). GENERAL FUNDAMENTALS OF RECREATION. (3)
First and second semesters. This course is designed for and limited to students not majoring in recreation who wish to develop some understanding of the place, importance and potentialities of recreation in modern life. Included will be limited study of the areas of philosophy, program planning, leadership techniques, organization and administration, and interrelationships with other fields. (Staff)

RECR 349 (140). OBSERVATION AND FIELD WORK IN RECREATION. (5)
First and second semesters. Summer session. Limited to recreation majors. Appropriate observations and field work placement will be selected and assigned on the basis of the student's interest and future employment plans. The field work experience itself will be expected to provide, (1) face to face leadership activity, (2) participation in staff activities and responsibilities as feasible (filing, making of reports, etc.), and (3) exposure to any and all infra and inter agency or department relationships and activities (budget hearings, training sessions, board meetings, etc.) (Churchill and Strobell)

RECR 375 (175). INTRODUCTION TO THERAPEUTIC RECREATION. (3)
First and second sessions. A study of the nature of physical and emotional deficiency and illness, the effect upon them of various recreation skills, activities and programs, and the method recommended for the latter's implementation. (Bushart)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

RECR 415 (196). QUANTITATIVE METHODS. (3)*
First and second semesters. Summer session. A course covering the statistical techniques most frequently used in research pertaining to recreation. An effort will be made to provide the student with the necessary skills, and to acquaint him with the interpretations and practical applications of these techniques. (Staff)

RECR 420 (120). PROGRAM PLANNING. (3)*
First and second semesters. Prerequisite, RECR 130 or RECR 325. Study of the various aspects, problems and practices of agency, military, 'exceptional,' and govern-

mental recreation programs and their planning (with particular emphasis on playground, community and teen center plans and procedures). Observations will be required (Strobell)

RECR 426 (240). INDUSTRIAL RECREATION. (3)*
First and second semesters. Summer session. An introductory study of the philosophy of and practices and problems in industrial recreation. Where possible the course will include opportunities for observation and visiting specialists. (Staff)

RECR 432 (202). PHILOSOPHY OF RECREATION. (3)*
First and second semesters. Summer session. A study of the meanings, relationships, and services of recreation as expressed by past and present authorities and leaders. This course should be of interest to people active in education, social work and related fields. (Churchill)

RECR 450 (150). CAMP MANAGEMENT. (3)*
First and second semesters. Summer session. Prerequisite RECR 150 or experience. An advanced camping course for those students with previous training and experience; organization, administration, programming, current trends, evaluation, and special problems. Whenever possible, visiting specialists and field trips will be included. (Harvey)

RECR 454 (184) OUTDOOR EDUCATION. (6)*
First and second sessions. Summer session. Field experience in an outdoor setting will be used to present the activities and techniques recommended for modern outdoor education practice. Where possible groups of participants will be utilized as subjects for practice instructional work. Activity will emphasize not only the subject matter of science and education but also the broad concepts of conservation, worthy use of leisure time, education for democratic living, etc. (Eley and Leedy)

RECR 460 (180). LEADERSHIP TECHNIQUES AND PRACTICES. (3)*
First and second semesters. Prerequisite: RECR 130 or 325. A study of the various kinds and levels of leadership exerted by professional and volunteer workers, some of the difficulties and probable weaknesses to be met, and some of the tangible techniques to be used in personnel, staff and public relationships. The group work approach will be emphasized and used, insofar as possible in the solution of particular problems that grow out of required field experiences in handling on or off campus groups. (Leedy)

RECR 463 (203). SUPERVISORY TECHNIQUES IN RECREATION. (3)*
First and second semesters. Summer session. A study of the principles, methods, techniques as well as an analysis of the functions of supervision in the recreation and parks environment. This course is designed to advance the student's understanding of the art of building human relationships, and to apply the emerging concepts and principles of modern supervision to practical situations in which administrators, supervisors, leaders (both professional and paraprofessional) and volunteers are working. (Strobell)

RECR 476 (260). HOSPITAL RECREATION. (3)*
First and second semesters. Summer session. An introductory study of the philosophy of and practices in hospital and institutional recreation. Where possible the course will include opportunities for observation and visiting specialists. (Staff)

RECR 489 (189). FIELD LABORATORY PROJECTS AND WORKSHOP. (1-6)*
First and second semesters. Summer session A course designed to meet the needs of persons in the field with respect to workshops and research projects in special areas of knowledge not covered by regularly structured courses. (Staff)

RECR 490 (190). ORGANIZATION AND ADMINISTRATION OF RECREATION. (3)*
First and second semesters. Summer session. A study of the organizational patterns and administrative problems involved in the various types of operating recreation groups and agencies; forms of organization; finance and budget; personnel; areas, facilities and equipment; public relations. (Churchill)

RECR 495 (185). PLANNING, DESIGN AND MAINTENANCE OF PARK AND RECREATION AREAS AND FACILITIES. (3)*
First and second semesters. A study of the relation of the park and recreation system to the total community planning process; area layout, design and maintenance of facilities. Field experience will include the conducting of actual community surveys and preparation of site plans as requested by various community groups. The development of such studies will include inspection of areas, site analysis, preparation of plans, and their presentation to the community. (Stevenson)

*These courses may be taken for graduate credit with the permission of the advisor. Students taking 400 level courses for graduate credit will be expected to carry out a special project.

FOR GRADUATES

See the *Graduate School Catalog* for descriptions.

RECR 600 (200). SEMINAR IN RECREATION. (1)
RECR 610 (210). METHODS AND TECHNIQUES OF RESEARCH (3)
RECR 613 (230). SOURCE MATERIAL SURVEY. (3)
RECR 633 (201). FOUNDATIONS OF RECREATION. (3)
RECR 634 (204). MODERN TRENDS IN RECREATION. (3)
RECR 688 (288). SPECIAL PROBLEMS IN RECREATION. (1-6)
RECR 690 (290). ADMINISTRATIVE DIRECTION OF RECREATION. (3)
RECR 700 (287). ADVANCED SEMINAR. (1-3)
RECR 799 (399). RESEARCH—THESIS. (Master's Level) (1-5)
RECR 899 (499). RESEARCH—DISSERTATION. (Doctoral Level) (1-6)

HEALTH EDUCATION

This curriculum is designed to prepare the student to give leadership in the development of the school health program including (1) health services, (2) healthful environment and (3) health instruction. Graduates of the departmental program have placement opportunities as health educators in the public schools and community colleges as well as in the public and voluntary health agencies, i.e. local health departments, local affiliates of the American Cancer Society, American Heart Association, etc. The minor is planned to be particularly suitable for students who major in physical education, home economics and education at either the elementary or secondary level.

HEALTH CURRICULUM

	Semester	
Freshman Year	I	II
ENGL 101, 201—Composition and American Literature	3	3
SOCY 100—Introduction to Sociology	3	..
ZOOL 101—General Zoology	.	4
SPCH 107—Public Speaking	2	..
PHED—Orientation: Developmental and Combative (Men) or		
PHED—Orientation Activities: Swimming (Women)	1	1
CHEM 103, 104—General Chemistry	4	4
ANTH 101 or 102—Introduction to Anthropology	3	.
HLTH 140—Personal and Community Health	..	3
Electives	..	3
Total	16	18

Sophomore Year		
ENGL 202—World Literature	3	.
HIST—(General Education Requirements)	3	3
ZOOL 201, 202—Human Anatomy and Physiology	4	4
HLTH 150—First Aid and Safety	..	1
HLTH 270—Safety Education	3	..
PHIL—(General Education Requirement)	..	3
MATH—(Gen. Ed. Requirement other than Math 1)	3	..
NUTR 100	..	3
Electives	..	3
Total	16	17
Junior Year		
EDMS 410—Educational Measurement or HLTH 480—Measurement in Physical Education and Health	..	3
MICB 200—General Microbiology	4	..
MICB 420—Epidemiology and Public Health	..	2
HLTH 310—Introduction to School Health Education	2	..
HLTH 420—Methods and Materials in Health Education	..	3
EDUC 300—Human Development and Learning	6	..
EDUC 301—Foundations of Education	..	3
PSYC 100—Introduction to Psychology	3	..
PSYC 235—Personality and Adjustment	..	3
Electives	3	3
Total	18	17
Senior Year		
HLTH 340—Curriculum Instruction and Observation	..	3
HLTH 450—Health Problems of Children and Youth	3	..
HLTH 390—Org. and Adm. of School Health Programs	3	..
EDSE 330—Principles and Methods of Secondary Ed.	..	3
EDSE 374—Student Teaching in Secondary Schools	..	8
Electives	9	..
Total	15	14

DEGREE REQUIREMENTS IN HEALTH EDUCATION

Requirements for the Bachelor of Science degree in health education in the College of Physical Education and Health are as follows:

	Sem. Cr.
Foundation science courses (Zool 101, 201, 202; MICB 200, 420; CHEM 103, 104)	26
General Education Requirements (ENGL 101, 201, 202; PHIL, ANTH, SOCY I; HIST (6 hours); MATH (Any above MATH 001)	27
Other specified requirements (SPCH 107; PSYCH 100, 235; NUTR 100)	11
Professional Health Education courses (HLTH 140, 150, 270, 310, 420, 340, 450, EDMS 410, 480, 390)	24
Education requirements (EDUC 300, 301; EDSE 330, 374)	20
Physical Education requirements	2
Electives	20
Total	130

MINOR IN HEALTH EDUCATION—24 hour minor

Twelve semester hours in health education (HLTH 140, 150, 310, 420, 450)

Twelve semester hours in related areas:

Six semester hours of biological science.

Six semester hours of psychology or human development.

MINOR IN SAFETY EDUCATION

Students wishing to obtain a minor in safety education and become certified to teach safety and driver education in junior and senior high schools should take the following courses: HLTH 150 (1), HLTH 260 (2), HLTH 270 (3), HLTH 280 (3), HLTH 305 (3), HLTH 345 (3), ENPF 280 (3), and ENPF 290 (3). In addition, six hours of psychology (other than the general education requirements) are required.

THE FACULTY

Professors: Burt, Johnson.
Associate Professors: Jones, Kenel, Leviton, Tifft.
Assistant Professors: Miller, Clearwater.
Instructors: Beno, Harich, Needle, Nowack, Raymond, Sands, Waters.

HLTH 110 (010). ORIENTATION TO HEALTH EDUCATION. (1)
First and second semesters. This course explores the field of health education in both the school and the community from the point of view of the health educator. Professional preparation and career opportunities are considered. (Staff)

HLTH 130 (030). INTRODUCTION TO PHYSICAL EDUCATION, RECREATION, AND HEALTH. (3)
First and second semesters. Development of understanding and appreciation of the historic and significant purpose and place of each of the specialized areas in general education. A study of the educational and personal requirements and opportunities of a career in each professional area. Students will be acquainted with the status and trends of each area. (Staff)

HLTH 140 (040). PERSONAL AND COMMUNITY HEALTH. (3)
First and second semesters. Summer session. Meaning and significance of physical, mental and social health as related to the individual and to society; important phases of national health problems; constructive methods of promoting health of the individual and the community; health problems young people encounter with special emphasis on health knowledge for future teachers. (Needle, Nowack, Waters)

HLTH 150 (050). FIRST AID. (1)
First and second semesters. Lecture, demonstration, and skill training in first aid measures for resuscitation, hemorrhage control, shock, burns, poisons, and bone injuries. Red Cross and Medical Self-Help certification awarded. (Raymond)

HLTH 260 (060). INSTRUCTOR'S COURSE IN FIRST AID. (2)
First and second semesters. Prerequisite, Health 150 or equivalent. Advanced consideration of first aid techniques; orientation to methods, techniques and teaching aids; practical classroom instruction required. Red Cross instructor's certification awarded. (Raymond)

HLTH 270 (070). SAFETY EDUCATION. (3)
First and second semesters. Safety in the home, school and community. Safety education programs in the public schools. (Beno, Clearwater)

HLTH 280 (080). THE DRIVER AND HIS CHARACTERISTICS. (3)
First and second semesters. Prerequisite, Health 270. The aim of this course is to treat the driver behavior problem in its relation to many of the psychophysical factors and forces in the traffic environment that impinge upon the man behind the wheel. (Kenel)

FOR ADVANCED UNDERGRADUATES

*This course may be taken for graduate credit with the permission of the advisor. Students taking 400 level courses for graduate credit will be expected to carry out a special research project.

HLTH 305 (105). DRIVER EDUCATION AND TRAFFIC SAFETY I. (3)

First and second semesters. Summer session. Prerequisites, Health 270, 280. This course is a study of the place of the automobile in modern life and deals with the fundamentals, principles, practices, and content of high school driver education and traffic safety. Laboratory experience consists of observation and experience in teaching beginners to drive in dual control cars and simulators. Course includes eight weeks of practice teaching. (Staff)

HLTH 310 (110). INTRODUCTION TO THE SCHOOL HEALTH PROGRAM. (2)

First and second semesters. Prerequisites, Health 105 or Health 140. This course deals with the aspects of school health: health environment, health services, and health education. The relationships of the school health program and the general education program are emphasized. The roles of teachers, administrators, health specialists, and others in related fields are discussed. (Waters)

HLTH 340 (140). CURRICULUM, INSTRUCTION AND OBSERVATION. (3)

First and second semesters. Summer session. Prerequisites, Health 140, 270, 310, 420. A course designed to provide directed observation and discussion, coordinating these experiences with those from previous methods courses in the development of curricula for health and physical education. The course is planned to prepare for student teaching which follows in the same semester. The observations will be made of health programs in junior and senior high schools. This course must be taken during the semester in which the student is doing student teaching. (Tifft)

HLTH 345 (145). DRIVER EDUCATION AND TRAFFIC SAFETY II. (3)

First and second semesters. Summer session. Prerequisites Health 270, 280, 305, or their equivalents. Comprehensive programming for driver education; teaching to meet driving emergencies and winter conditions; resources and agencies; the teacher and driver education; consumer education, insurance and liability. (Kenel)

HLTH 365 (165). ORGANIZATION ADMINISTRATION AND SUPERVISION OF SCHOOL SAFETY EDUCATION. (3)

Summer session. Prerequisites, Health 270, 280, 305, 345 or their equivalents. Designed for teachers, school administrators, college instructors, and others responsible for directing or supervising safety programs in the schools. Deals with the problems, policies, practices, and procedures involved in the organization, administration and the supervision of a comprehensive accident prevention and safety education program for the schools. Considers integration factors of the school safety programs with the special emphasis on traffic programs. (Clearwater)

HLTH 375 (175). PROBLEMS IN DRIVER AND TRAFFIC SAFETY EDUCATION. (3)

Summer session. Prerequisites, Health 270, 280, 305, 345, or their equivalents. An advanced course which gives consideration to the individual problems encountered in teaching driver and safety education. The psychology of teaching and learning are emphasized. Consideration is given to the implications of emotion and attitude factors in driver and traffic education. The course includes an examination of existing courses of study, research, supervisory and evaluation practices. (Kenel)

HLTH 390 (190). ORGANIZATION AND ADMINISTRATION OF SCHOOL HEALTH PROGRAMS. (3)

First semester. Summer session. The three major aspects of the school health program are considered. Problems connected with health services, health instruction, and the health aspects of the school environment are discussed. The responsibilities of school personnel are delineated with emphasis on the role of the administrator. (Nowack)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

HLTH 420 (120). METHODS AND MATERIALS IN HEALTH EDUCATION. (3)*

First and second semesters. Summer session. Prerequisites, Health 105 or Health 140; Health 310 or consent of instructor. The purpose of this course is to present the interrelationships of curriculum planning, methodology and the selection and use of teaching aids and materials. Special problems associated with health teaching are discussed. Students will become familiar with a variety of resources as well as planning for and presenting demonstration lessons. (Tifft)

HLTH 450 (150). HEALTH PROBLEMS OF CHILDREN AND YOUTH. (3)*

First and second semesters. Summer session. This course involves a study of the health needs and problems of pupils from the primary grades through high school. Physical, mental and psychosomatic aspects of health are considered in relation to the developmental and school levels. Consideration is given to such topics as diet selection and control; exercise, recreation and rest; emotional upset and its implications; and psychosexual development and problems. The role of the teacher and parent in encouraging optimal health is emphasized. (Miller)

HLTH 455 (155). PHYSICAL FITNESS OF THE INDIVIDUAL. (3)*

First and second semesters. Summer session. A study of the major physical fitness problems confronting the adult in modern society. Consideration is given to the scientific appraisal, development and maintenance of fitness at all age levels. Such problems as obesity, weight reduction, chronic fatigue, posture, and special exercise programs are explored. This course is open to persons outside the fields of Physical Education and Health. (Staff)

HLTH 460 (160). PROBLEMS IN SCHOOL HEALTH EDUCATION IN ELEMENTARY AND SECONDARY SCHOOLS. (2-6)*

First and second semesters. Summer session. This is a workshop type course designed particularly for inservice teachers to acquaint them with the best methods of providing good health services, healthful environment and health instruction. (Staff)

HLTH 470 (170). THE HEALTH PROGRAM IN THE ELEMENTARY SCHOOL. (3)*

Second semester. Summer session. Prerequisites, Health 105 or 140; 310. This course, designed for the elementary school classroom teacher, analyzes biological and sociological factors which determine the health status and needs of the individual elementary school child. The various aspects of the school program are evaluated in terms of their role in health education. The total school health program is surveyed from the standpoint of organization and administration, and health appraisal. Emphasis is placed upon modern methods and current materials in health instruction. (The State Department of Education accepts this course for biological science credit.) (Staff)

HLTH 478 (178). FUNDAMENTALS OF SEX EDUCATION. (3)*

First and second semester. Summer session. This course is concerned with basic informatiton regarding the physical, psychological, social, historical, semantic and comparative cultural aspects of sex. The adjustment needs and problems of children and adults during the course of maturing and aging are studied; and special consideration is given to the sex education program in schools. (Johnson, Leviton, Sands)

HLTH 480 (180). MEASUREMENT IN PHYSICAL EDUCATION AND HEALTH. (3)*
First and second semesters. Summer session. Two lectures and two laboratory periods per week. The application of the principles and techniques of educational measurement to the teaching of health and physical education; study of functions and techniques of measurements in the evaluation of student progress toward the objectives of health and physical education, and in the evaluation of the effectiveness of teaching. (Staff)

HLTH 488 (188). CHILDREN'S PHYSICAL DEVELOPMENTAL CLINIC. (1-4)*
First and second semesters. Summer session. Prerequisite, at least junior standing in health, physical education and recreation, or by special permission of the director. An opportunity to acquire training and experience in a therapeutically oriented physical education-recreation program for children referred by various education, special education, medical and psychiatric groups. (Johnson)

HLTH 489 (189). FIELD LABORATORY PROJECTS AND WORKSHOP. (1-6)*
First and second semesters. Summer session. A course designed to meet the needs of persons in the field with respect to workshop and research projects in special areas of knowledge not covered by regularly structured courses.
Note: The maximum total number of credits that may be earned toward any degree in physical education, recreation, or health education under PHED, RECR, HLTH, or EDUC 489 is six. (Staff)

FOR GRADUATES

See the *Graduate School Catalog* for descriptions.

HLTH 600 (200). SEMINAR IN HEALTH (1)
HLTH 650 (250). HEALTH PROBLEMS IN GUIDANCE. (3)
HLTH 670 (270). STATUS AND TRENDS IN HEALTH EDUCATION. (3)
HLTH 687 (287). ADVANCED SEMINAR. (1-3)
HLTH 638 (288). SPECIAL PROBLEMS IN HEALTH EDUCATION. (1-6)
HLTH 690 (290). ADMINISTRATIVE DIRECTION OF HEALTH EDUCATION. (3)
HLTH 710 (210). METHODS AND TECHNIQUES OF RESEARCH. (3)
HLTH 720 (220). SCIENTIFIC FOUNDATIONS OF HEALTH EDUCATION. (3)
HLTH 740 (240). MODERN THEORIES OF HEALTH. (3)
HLTH 760 (260). PUBLIC HEALTH. (3)
HLTH 791 (291). CURRICULUM CONSTRUCTION IN HEALTH EDUCATION. (3)
HLTH 799 (399). RESEARCH—THESIS. (1-5)
HLTH 899 (499). RESEARCH—DISSERTATION (1-5)

REQUIRED HEALTH EDUCATION FOR MEN AND WOMEN

All students are required to complete one semester of Science and Theory of Health (HLTH 105) for graduation. Transfer students who do not have credit for a similar course must complete it before graduation. The department provides special sections each semester for upperclassmen. This semester course is designed to meet the functional health needs and interests of college men and women. The basic units of instruction have evolved from present day scientific knowledge. It is hoped that through this health course the students will be better able to develop sound attiudes, behaviors and knowledge that will facilitate a more effective type of living. Audio-visual aids, reading, reports, guest speakers, and lectures help to enrich the class. The University environment, the personal and group adjustments which the students must make are considered to form the core of this course.

Men and women who have reached their thirtieth birthday at matriculation are exempt from HLTH 105. Military services does *NOT* exempt the student from the HLTH 105 requirement. The Department offers a proficiency examination as outlined in the *General and Academic Regulations* of the University, which allows the student to establish credit for HLTH 105 by examination.

HLTH 105. SCIENCE AND THEORY OF HEALTH. (2)
First and second semesters. Summer session. A course concerned primarily with sound health knowledge, attitudes and behaviors as they apply to the individual. The major subjects dealt with in this course are: mental health and social adjustment; human reproduction and sex education; organic efficiency; ecology and health; and the need for health education and community action for health from local to world levels. (Staff)

MINORS IN OTHER AREAS

It is relatively easy for any student majoring in one curriculum of this college to complete the requirements for a minor in a cognate area of the college, as indicated after each major curriculum. Those who plan to teach in the public schools might wish to also qualify in another area. This is more difficult with the limited number of elective credits and must be planned carefully in advance. If it seems advisable, the dean may waive certain required courses to allow development of a needed minor, or the student may be able to carry a heavier load than normal if his grade average permits.

Students majoring in physical education or health education should begin preparing for a teaching minor in a subject matter area during the sophomore year, if possible. Many opportunities exist in junior and senior high schools for a combination teacher of physical education and/or coach and a teacher of science, mathematics, history, etc.

ENGLISH MINOR

A minor in English requires 23 semester hours. It includes 9 semester hours of composition and literature, 3 semester hours of advanced American literature, and 11 hours of electives. Electives must be chosen with the approval of the adviser and with the recommendations of the English Department.

MATHEMATICS MINOR

Two options should be noted for those desiring to take a concentration in Math. If a person scored in Category 1 of the Math Placement Test, he should follow option 1—if he scored in Category 2, he should follow option 2.

Option 1		Option 2	
MATH	115 3 hrs.	MATH	110 3
MATH	140 4	MATH	111 3
MATH	141 4	MATH	220 3
MATH	240 4	MATH	221 3
MATH	240 3)	MATH	240 3)
MATH	400 3) either one	MATH	400 3) either one
MATH	470 4)	MATH	470 4)
	18-19		15-16

PSYCHOLOGY MINOR

For a minor in Psychology at least 21 semester hours are required. The student should select the biological or the sociological approach to this minor.

A. Biological: Psychology 100, Introduction to Psychology (3); Psychology 206, Developmental Psychology (3); Psychology 200, Statistical Methods in Psychology (3); Psychology 410, Experimental Psychology—Sensory Processes (4); Psychology 400, Experimental Psychology; Sensory Processes I (4); Psychology 441, Psychology of Human Learning (3); Psychology 402, Physiological Psychology (3).

B. Sociological: Psychology 100, Introduction to Psychology (3); Psychology 235, Personality and Adjustment (3); Psychology 221, Social Psychology (3); Psychology 206, Developmental Psychology (3); Psychology 200, Statistical Methods in Psychology (3); Psychology 420, Experimental Psychology—Social Behavior (4); Psychology 441, Psychology of Human Learning (3).

SOCIAL SCIENCE MINOR

For a minor in this group, 24 semester hours are required as follows: History, 18 semester hours (including one year each of American and European history), economics, sociology, government, consumer education or geography, 6 semester hours.

SCIENCE MINORS

A. General Science: 30 semester hours are required for a minor in general science including the following courses: CHEM 103, 104, General Chemistry (4,4); ZOOL 101, General Zoology (4); BOTN 100, General Botany (4); PHYS 111, 112, Elements of Physics (3, 3) or PHYS 121, 122, Fundamentals of Physics (4, 4). The remaining 6 or 8 semester hours will be chosen subject to the approval of the student's major advisor and of the science department in which his interest lies. ZOOL 201 and 202 (4, 4) are approved courses.

B. Biological Minor: 20 semester hours are required for a biological minor and will include the following courses: ZOOL 101, General Zoology (4); ZOOL 201, and 202, Human Anatomy and Human Physiology (4, 4); CHEM 101, General Chemistry (4); BOTN 100, General Botany (4).

C. Minors of 20 semester hours are also offered in chemistry and physics. A minor in chemistry must be supported by a one-year course in physics. Other courses will be chosen subject to the approval of the student's major advisor and the science department in which the student's interest lies.

SOCIOLOGY MINOR

For a minor in Sociology at least 18 semester hours are required as follows: Sociology 100, Introduction to Sociology; Sociology 200, Principles of Sociology (3); three semester hours chosen from Sociology 473, Rural-Urban Relations (3), Sociology 473, The City (3), Sociology 330, Community Organization (3), or Anthropology 401 (3); three semester hours chosen from a social psychology group—Sociology 430, Sociology of Personality (3); Sociology 433, Social Control (3), Sociology 447, Small Group Analysis (3); and three semesters hours from an applied sociology group —Sociology 460, Sociology of Occupations and Careers (3), Sociology 462, Industrial Sociology (3), Sociology 464, Military Sociology (3), Sociology 410, Population (3), Sociology 310, Introduction to Social Service (3), Sociology 457, Sociology of Law (3), Sociology 450, Juvenile Delinquency (3), Sociology 400, Sociological Theory (3).

SPEECH MINOR

A minor of 22 semester hours is offered in speech. The minimum requirements for this minor are 12 semester hours in addition to the 10 semester hours of departmental requirements in Speech 100, 110, 200. The 12 semester hours above the departmental requirements must include 6 semester hours of courses numbered 300 or higher. All programs for minors must be approved by the departmental advisor.

COLLEGE OF PHYSICAL EDUCATION, RECREATION AND HEALTH

ADMINISTRATIVE OFFICERS

EYLER, Marvin H., Professor and Dean of College of Physical Education, Recreation and Health
A.B., Houghton College, 1942; M.S., University of Illinois, 1948; Ph.D., 1956.

FELLOWS, Frank C., Instructor and Coordinator of Facilities
B.S., University of Maryland, 1953; M.A., 1957.

FACULTY

ARRIGHI, Margarite A., Assistant Professor of Physical Education
B.S., Westhampton College University of Richmond, 1958; M.A., University of Maryland, 1962.

BENO, John, Instructor of Safety and Driver Education
B.S., Eastern Illinois University, 1962, M.S., 1963.

BURT, John, Professor and Head, Department of Health Education
B.A., Duke University, M.Ed., University of North Carolina, M.S. University of Oregon; Ed.D., University of Oregon.

CAMPBELL, William R., Assistant Professor of Physical Education and Head Swimming Coach
B.S., Springfield College, 1949; M.Ed., 1953.

CHURCH, Kenneth R., Associate Professor of Physical Education
B.S., University of Northern Iowa, 1946; M.S., University of Iowa, 1955; PE.D., Indiana University, 1963.

CHURCHILL, John W., Associate Professor of Recreation
B.S. Cortland State College, 1958; M.S., University of Illinois, 1959; Ph.D., University of Wisconsin, 1968.

CLARKE, David H., Professor of Physical Education
B.S., Springfield College, 1952; M.S., 1953; Ph.D., University of Oregon, 1959.

CLEARWATER, Harvey E., Assistant Professor of Safety and Driver Education
A.B. State University of N.Y., Albany, 1955; M.A., Michigan State University, 1967; Ed.D., 1970.

CRONIN, Frank H., Associate Professor of Physical Education; Head Golf Coach
B.S., University of Maryland, 1946.

DRUM, Barbara A., Instructor in Physical Education
B.S., Pennsylvania State University, 1958; M.A., University of Iowa, 1963.

FREUNDSCHUH, J., Assistant Professor of Physical Education
B.S., University of Alabama, 1953; M.A., 1954.

FRINGER, Margaret N., Instructor in Physical Education
B.S., University of North Carolina, Greensboro, 1957; M.A., University of Michigan, 1961.

HARICH, M. Virginia, Instructor in Health Education
B.S., Catholic University, 1965; M.A., University of Maryland, 1968.

HARRINGTON, Richard I., Assistant Director of Intramurals
B.S., University of Maryland, 1968.

HARVEY, Ellen E., Professor and Chairman, Department of Recreation
B.S., New College, Columbia University, 1935; M.A., Teachers College, Columbia University, 1941; Ed.D., University of Oregon, 1951.

HULT, Joan S., Assistant Professor of Physical Education
B.S., Indiana University, 1954; M.Ed., University of North Carolina, 1957; Ph.D., University of Southern California, 1967.

HUMPHREY, James H., Professor of Physical Education and Health
A.B., Denison University, 1933; A.M., Western Reserve University, 1946; Ed.D., Boston University, 1951.

HUSMAN, Burris F., Professor of Physical Education
B.S., University of Illinois, 1941; M.S., 1948; Ed.D., University of Maryland, 1954.

INGRAM, Anne G., Assistant Professor of Physical Education
A.B., University of North Carolina, 1944; M.A., University of Georgia, 1948; Ed.D., Teachers College, Columbia University, 1962.

JACKSON, Elton S., Instructor in Physical Education
B.S., University of Maryland, 1958.

JOHNSON, Ronald C., Instructor in Physical Education
B.S., Baylor University, 1956; M.S., 1958.

JOHNSON, Warren R., Professor of Physical Education and Health
B.A., University of Denver, 1942; M.A., 1947; Ed.D., Boston University, 1950.

JONES, Herbert L., Associate Professor of Health Education
B.S., Wisconsin State College, 1954; M.S., University of Wisconsin, 1957; H.S.D., Indiana University, 1963.

KELLEY, David L., Associate Professor of Physical Education
A.B., San Diego State College, 1957; M.S., University of Southern California, 1958; Ph.D., 1962.

KENEL, Francis C., Associate Professor of Safety and Driver Education
B.S., Michigan State University, 1955; M.A., 1957; Ph.D., 1967.

KESLER, Ethel, Assistant Professor of Physical Education
B.S., Woman's College, University of North Carolina, 1949; M.S., Wellesley College, 1953.

KLAUS, Heidi, Instructor of Physical Education
Teaching Credential (requirement to degree), 1959, Loheland Gymnastikschule, Germany.

KOVALAKIDES, Nicholas J., Instructor in Physical Education and Director of Intramurals
B.S., University of Maryland, 1961; M.A., University of Maryland, 1968.

KRAMER, George P., Associate Professor of Physical Education
B.S., University of Maryland, 1953; M.A., 1956; Ph.D., Louisville State University, 1967.

KROUSE, William E., Assistant Professor of Physical Education and Head Wrestling Coach
B.S., University of Maryland, 1942; M.E.D., 1949.

LEEDY, Charlotte, Assistant Professor of Recreation
B.S., University of Maryland, 1960; M.A., University of Maryland, 1966.

LEVITON, Daniel, Associate Professor of Health Education
B.S., George Washington University, 1953; M.S., Springfield College, 1956; Ph.D., University of Maryland, 1967.

LONG, Patricia A., Instructor in Physical Education
B.S., West Chester State College, 1969; M.A., University of Maryland, 1971.

LOVE, Alice M., Assistant Professor of Physical Education
B.S., University of Maryland, 1959; P.H., University of Florida, 1960; Ed.D., Teachers College, Columbia University, 1967.

McKNIGHT, Dorothy B., Assistant Professor of Physical Education
B.S., Ursinus College, 1957; M.Ed., Temple University, 1960.

MILLER, Catherine M., Assistant Professor of Health Education
B.S., Illinois State University, 1956; M.A., Colorado State College, 1959; Ph.D., Ohio State University, 1967.

MURRAY, Joseph F., Instructor in Physical Education
B.S., University of Maryland, 1967; M.A., University of Maryland, 1969.

NEEDLE, Howard R., Instructor of Health Education
B.S.Ed., Temple University, 1964; M.Ed., University of Toledo, 1967.

NOWACK, Dorothy, Instructor of Health Education
B.S., Wheaton College, 1948; M.Ed., Lehigh University, 1966.

RAYMOND, Pamela M., Instructor in Health Education
B.S., Central Michigan University, 1964; M.S., Indiana University, 1966.

REID, Diannee, Instructor in Physical Education
B.S., Howard University, 1969; M.A., Pennsylvania State University, 1970.

ROYER, Ruth H., Instructor in Physical Education
B.S., West Chester State College, 1958.

ROYS, Betty J., Instructor in Physical Education
B.A., Kent State University, 1960; M.A., Bowling Green State University, 1964.

SANDS, Doris W., Instructor in Health Education
R.N., Medical Center, Jersey City, 1948; B.S., Jersey City State College, 1948; M.A., University of Maryland, 1969.

SANTA-MARIA, D'Laine, Assistant Professor of Physical Education
B.A., University of Pennsylvania, 1962; M.Ed., Temple University, 1962; Ed.D., University of Oregon, 1968.

SIGLER, David P., Instructor in Physical Education
B.S., University of Maryland, 1962; M.A., University of Maryland, 1968.

STEEL, Donald H., Associate Professor of Physical Education
B.S., Trenton State Teachers College, 1955; M.A., University of Maryland, 1957; Ph.D., Louisiana State University, 1964.

STROBELL, Adah D., Associate Professor of Recreation
B.A., San Francisco State College, 1953; M.S., University of California at Los Angeles, 1958; Ph.D., University of Illinois, 1966.

STULL, G. Alan, Associate Professor of Physical Education
B.S., East Stroudsburg State College, 1955; M.S., The Pennsylvania State College, 1957, Ed.D., 1961.

TERAUDS, Juris, Instructor in Physical Education
B.S., University of Dubuque, 1961; M.A., California State College, 1964.

TIFFT, Margaret, Associate Professor of Health Education
B.S., Ohio State University, 1946; M.A., Columbia University, 1948; Ph.D., West Virginia University, 1969.

TYLER, Robert W., Assistant Professor of Physical Education
A.B., Drury College, 1957; M.S., The Pennsylvania State University, 1959; Ph.D., The Pennsylvania State University, 1969.

VANDER VELDEN, R. Lee, Assistant Professor of Physical Education
B.S., University of Wisconsin, 1961; Ph.D., University of Wisconsin, 1971.

WATERS, Corinda O., Instructor in Health Education
B.S., Morgan State College, 1937; M.A., Columbia University, 1944.

WRENN, Jerry P., Instructor in Physical Education
B.S., East Carolina State College, 1961; M.S., University of Tennessee, 1963; Ph.D., University of Maryland, 1970.

Professional Schools: Dental Hygiene

The primary responsibility of the dental hygiene profession is to promote optimal oral health through the provision of preventive and educational services complementary to those within the purview of the dental profession.

In clinical office practice the dental hygientist's services are provided under the supervision of a dentist and are defined and governed by state dental practice acts. Although minor differences exist between state laws, in general those services which constitute permissible dental hygiene practice include: obtaining the patient's medical and mental history; conducting a preliminary clinical oral examination of the teeth and surrounding tissues for diagnosis by the dentist; performing diagnostic procedures (x-rays, impressions for study casts, saliva tests, oral cytologic smears, etc.) for use by the dentist; providing a complete oral prophylaxis (removal of all hard and soft deposits and stains and polishing of natural and restored surfaces of the teeth); applying topical medicaments and preventive agents; and assisting with office duties as assigned by the dentist. The dental hygienist also assumes a major role in patient education and counseling and supervision of oral hygiene practices.

Although the majority of dental hygienists are employed in dental offices, there are numerous opportunities and a growing need for those with baccalaureate and graduate degrees in dental hygiene education, community or public health, private and public institutions, commissioned service in the Armed Forces, research, and other special areas of practice. The dental hygienist's activities in these areas are dependent in varying degrees upon dental knowledge and skills in providing clinical services. However, additional study beyond the basic dental hygiene curriculum is essential preparation for advanced professional career opportunities.

PROGRAM DESCRIPTION

Dental hygiene offers only a four-year baccalaureate degree program. The curriculum includes two years of preprofessional courses, a third year of intensive dental and dental hygiene study with clinical application and a fourth year of advanced clinical practice and upper division electives in a recommended area of study, which will constitute a minor related to a specialized area of dental hygiene practice. The first two years of the preprofessional curriculum include general education requirements of the University of Maryland, dental hygiene education accreditation requirements and elective lower division courses in one of the recommended minor areas of study. Completion of the preprofessional curriculum at the University of Maryland or another campus will be required for eligiblity to apply for enrollment in dental hygiene as a junior. A suggested course sequence for the first two years follows:

PROGRAM DESCRIPTION

Freshman Year	1st Sem.	2nd Sem.
** English 101—Composition	3	
** Chemistry 103, 104—General	4	4
* Philosophy 100, 140 or 170	3	
* Math 110	3	
** Psychology 100—General	3	
Zoology 101—General (prerequisite for Anatomy and Physiology		4
* English—Literature		3
** Sociology 100—Introduction		3
Elective		3
* P.E.	(1)	(1)
Totals	17	18
* History	3	3
* English Literature	3	
** Zoology 201, 202—Anatomy and Physiology	4	4
** Nutrition 200—For health science majors	3	
** Microbiology 200		4
Electives in selected minors (lower division)	3	6
* Health 5—Health Education	(2)	
	18	17

*General Education Requirement
**Dental Hygiene Prerequisite

Although courses may be interchanged during the first two years, it is recommended that chemistry precede microbiology and nutrition to enable its application to these two subjects. It should be noted that Zoology 101 is a prerequisite for Zoology 201, 202 (Human Anatomy and Physiology) at the University of Maryland. Among the philosophy courses offered at the University, the following, listed in order of preference, are considered to be the most appropriate for the education of the dental hygienists: Philosophy 140—Ethics, Philosophy 170—Elementary Logic and Semantics or Philosophy 100—Introduction.

To prepare for upper division courses in the student's minor during the senior year, the 12 hours of lower division electives should be taken in *one* of the following areas of study: basic sciences, social sciences or health education. Lower division courses in one of these minors will be accepted as prerequisites for upper division courses in education, should this minor be elected during the senior year. The Department of Dental Hygiene faculty will counsel students in the selection of courses for one of the recommended minors.

ADMISSIONS AND APPLICATIONS PROCEDURES

HIGH SCHOOL STUDENTS

High school students who wish to enroll in the predental hygiene curriculum, should request applications directly from the Admissions Offices of the University of Maryland, College Park, Maryland 20742.

Young women or men who wish to prepare for a baccalaureate degree program in dental hygiene should pursue an academic program in high school including the following recommended subjects: biology, chemistry, math, and physics.

PREDENTAL HYGIENE STUDENTS

Predental hygiene students who have completed three semesters of the preprofessional curriculum should request an application at the end of the third semester from the department of Dental Hygiene, University of Maryland School of Dentistry, Baltimore, Maryland 21201. *Applications for the Baltimore campus should be received no later than June 1 prior to the fall semester for which the student wishes to enroll.*

Only those students who have successfully completed the two year preprofessional curriculum at the University of Maryland or another college or university will be eligible for admission to the Department. *Because enrollment must be limited to 24 students, registration in the preprofessional curriculum does not assure the student of acceptance in the dental hygiene program.* All applicants will be required to submit Dental Hygiene Aptitude Test scores (DHAT information is available from the Department of Dental Hygiene) and to appear for a personal interview at the discretion of the Dental Hygiene Committee on Admissions. A minimum of C average in the preprofessional curriculum will be required, and preference will be given to those students who have maintained high scholastic records.

REGISTERED DENTAL HYGIENISTS

Registered dental hygienists who have completed a two year accredited dental hygiene program at another college or university, should apply to enroll in the preprofessional curriculum at one of the three University of Maryland campuses. Upon completion of general education, basic and social science, and elective requirements at the University of Maryland, dental hygiene credits will be evaluated for transferability by the Department of Dental Hygiene and the Baltimore campus Director of Admissions. Registered dental hygienists should write directly to the Department of Dental Hygiene for additional information.

Professional Schools: Medical Technology

The School of Medicine Medical Technology

The University of Maryland Medical Technology program is four years in length, leading to a Bachelor of Science degree. The first three years are devoted to basic studies at the College Park campus. The last year is spent in clinical studies at University Hospital on the Baltimore City campus of the University of Maryland.

This program is administered by the School of Medicine, although the students have previously been registered in the School of Nursing at College Park as a temporary administrative measure. The curriculum in medical technology complies with the requirements and recommendations of the Board of Schools of the American Society of Clinical Pathologists (and the American Medical Association Council on Medical Education). Graduates of the program will be eligible to take the examination for registration given by the Board of Registry of the American Society of Clinical Pathologists.

ADMISSION

Applicants must meet the admission requirements of the University of Maryland. At least three years of college preparatory mathematics and at least three years of science, including chemistry and physics, are strongly recommended.

CURRICULUM

Students must complete 90 semester-hours or more in academic subjects before being admitted to the senior year. (The two semester hours in HLTH 105 and in physical education do not count toward this 90 semester hour total). The following courses are intended as a guide for the student in planning a curriculum which will meet both the University of Maryland requirements for graduation and the special requirements for the Registry Examination administered by the ASCP board of Schools.

MEDICAL TECHNOLOGY REQUIREMENTS
(Pre-clinical Years)

CHEMISTRY (16-credit minimum)	Credits	
CHEM 103, 104—College Chemistry I, II	4	4
CHEM 105, 106—Principles of College Chemistry I, II	4	4
CHEM 201, 202—College Chemistry III and Laboratory	3	3
CHEM 203, 204—College Chemistry IV and Laboratory	2	2
CHEM 461, 463—Chemical Background for Biochemistry and Laboratory	2	2
CHEM 462, 464—Biochemistry and Laboratory	3	2

BIOLOGICAL SCIENCE (16-credit minimum)

ZOOL 101—General Zoology	4	
ZOOL 201, 202—Human Anatomy and Physiology	4	4
MICB 200—General Microbiology	4	
MATHEMATICS (6-credit minimum)		
MATH 110, 111—Introduction to Math	3	3
OR		
MATH 115, 140—Introductory Analysis and Analysis I	3	4

GENERAL EDUCATION COURSES (See University Requirements)

OTHER RECOMMENDATIONS

SPCH 100 or 107—Public Speaking
PSYC 100—Psychology
PHYS 121, 122 or 117—General Physics
ZOOL 246—Genetics
ZOOL 495—Animal Histology
ZOOL 475—General Parasitology

RECOMMENDED COURSE SEQUENCE FOR FIRST THREE YEARS

Freshman Year

First Semester		Second Semester	
Chemistry 103 or 105	4	Chemistry 104 or 106	4
Zoology 101	4	Math 111	3
Math 110	3	(or Math 140 = 4)	
(or Math 115 = 3)		Speech 100 (or 107)	3
English 101	3	Health 105	2
PHED	1	PHED	1
	15	English 201	3
			16

Sophomore Year

First Semester		Second Semester	
Chemistry 201	3	Chemistry 203	3
Chemistry 202	2	Chemistry 204	2
English 202	3	Microbiology 200	4
History	3	History	3
Psyc 100	3	†Physics 122 (or elective)	4
†Physics 117 (or 121)	4		16
	18		

Junior Year

First Semester		Second Semester	
*Chemistry 461	2	*Chemistry 462	3
*Chemistry 463	2	*Chemistry 464	2
Microbiology 440	4	Zoology 202	4
Zoology 201	4	Socy 100 (or other Soc. Science)	3
Phil 100 (or course in Fine Arts)	3	Elective	3
Elective	3		15
	18		

† Not required but highly recommended.
* Chemistry 203, 204 is highly recommended as a substitute.

COURSE SEQUENCE—SENIOR CLINICAL YEAR

Summer Semester	Sem. Hrs.
MEDT. 385 (185)—Histology	2
MEDT 380 (180)—Electronics, Instrumentation, and Statistical Tools	2
MEDT 390 (190)—Clinical Practice	3
	7

Fall Semester	Sem. Hrs.
MEDT 350 (150)—Clinical Chemistry	4
MEDT 360 (160)—Hematology-Coagulation I	3
MEDT 365 (165)—Immunohematology	3
MEDT 391 (191)—Clinical Practice	8
	18

Spring Semester	Sem. Hrs.
MEDT 355 (155)—Nuclear Medicine	1
MEDT 370 (170)—Microbiology (Mycology and Parasitology)	4
MEDT 361 (161)—Hematology-Coagulation II	2
MEDT 375 (175)—Serology/Clinical Microscopy	2
MEDT 395 (195)—Medical Technology Seminar	1
MEDT 392 (192)—Clinical Practice	8
	18

Professional Schools: Nursing

The School of Nursing

THE SCHOOL OF NURSING offers a four-year academic program leading to a Bachelor of Science degree in nursing. Students who complete the program are capable of practicing professional nursing in a variety of settings. Graduates are qualified to write the examination for licensure as Registered Nurses. The program is approved by the Maryland Board of Examiners for Nurses and is accredited by the National League for Nursing.

The College Park campus offers the academic courses required for lower division study in the undergraduate program of the School of Nursing. Upper division studies are offered on the Baltimore City campus.

CURRICULUM

It is required that all students, including registered nurses, enrolled in or transferring to the program in nursing use the following guidelines for the freshman and sophomore years:

Courses	*Semester Hours*
English Composition	3
Chemistry (including content in organic chemistry)	6-8
Human Anatomy and Physiology	6-8
Microbiology	3-4
*Social Sciences	12
**Humanities	15
Nutrition (recommended)	3
Electives	7-12
Minimum requirement for junior status	59-60

* Courses must include at least one in sociology and one in psychology.
** Courses must be selected from at least three departments.

A 2.0 cumulative grade point average in the lower division curriculum is required in order to be eligible to continue the program in the School of Nursing.

ADMISSION

Applicants should apply to the Director of Admissions of the University of Maryland, College Park, Md. 20742. Students should enroll in the college preparatory program in high school. The following subjects are specifically recommended in addition to other academic subjects required for high school graduation:

Mathematics (college preparatory)	3 units
Chemistry	1
Biology	1
Physics	1

FURTHER INFORMATION

Information about the lower division program may be obtained from room 209, Turner Laboratory, on the College Park campus. Upper division program information may be obtained from the School of Nursing, 655 West Lombard Street, Baltimore, Md. 21201.

Professional Schools: Pharmacy

The School of Pharmacy

The purposes of THE SCHOOL OF PHARMACY are to train students for the efficient, ethical practice of all branches of pharmacy; to instruct students in general scientific and cultural subjects so they can read critically, express themselves clearly and think logically as members of a profession and citizens of a democracy; and to guide students into productive scholarship and research for the increase of knowledge and techniques in the healing arts of pharmacy.

ACCREDITATION

The School of Pharmacy is accredited by the American Council on Pharmaceutical Education. The school holds membership in the American Association of Colleges of Pharmacy.

DEGREES

The degree of Bachelor of Science in Pharmacy will be conferred upon students who have successfully completed the pre-professional program and the three years required for the professional program in most of the accredited schools of pharmacy in the United States. At the School of Pharmacy at Baltimore the degree of Bachelor of Science will be conferred upon students who have met successfully all the requirements and have spent at least the fifth year in residence at the School of Pharmacy at Baltimore.

CORRESPONDENCE

All correspondence prior to entrance in the pre-professional Program of the Five-Year Curriculum at College Park should be addressed to the Director of Admissions, University of Maryland, College Park, Maryland, 20740.

All correspondence relative to entrance in the Professional Program of the Five-Year Curriculum should be addressed to the School of Pharmacy, University of Maryland, 636 W. Lombard Street, Baltimore, Maryland 21201.

On the College Park campus the Pharmacy student advisor's office is in the Turner Laboratory, Room 203, telephone number, 454-2540.

ACADEMIC PROGRAMS

FIVE YEAR PROGRAM

A minimum of five academic years of satisfactory college work is required for the completion of the present pharmacy curriculum of the University of Maryland. This five-year curriculum meets the minimum requirements established by the American Association of Colleges of Pharmacy and the American Council on Pharmaceutical Education.

At the University of Maryland the five-year program consists of two years of a preprofessional and a three-year pharmacy program. The pre-professional program is not available in Baltimore, but may be obtained at the College Park or Baltimore County (UMBC) Campuses of the University of Maryland or at any other accredited university or junior or senior college where appropriate courses are offered.

REGISTRATION WITH THE MARYLAND BOARD OF PHARMACY

The academic program of the School of Pharmacy is supplemented with an internship program governed by the Maryland Board of Pharmacy. During this time the student acquires practical experience in the application of his academic work.

The Maryland Pharmacy Law, as amended in 1971, requires all students entering upon the study of pharmacy in the State to file application with the Maryland Board of Pharmacy. The law reads as follows:

"Any person enrolling as a student of pharmacy in any school or college of pharmacy in this State shall not later than thirty days after enrolling, file with the Secretary of the Maryland Board of Pharmacy, an application for registration as a student of pharmacy in which said application he shall be required to furnish such information as the Board may deem appropriate, and simultaneously with the filing of said application, shall pay the Board a fee of one dollar; all such students of pharmacy shall, at the beginning of any subsequent school or college year, submit to the said Board a sworn statement of any and all actual internship experience acquired during the preceding year as requested by the Board.

PREPROFESSIONAL PROGRAM

The preprofessional curriculum is designed to provide the student with those courses that satisfy the needs for a more liberal education as well as the scientific prerequisite courses for entrance into the professional program. The following course listing contains the course numbers from the College Park campus and are offered for comparison with other school catalogs. The following program can be taken at the University of Maryland College Park or Baltimore County campuses, or at any other accredited university, senior or junior college:

First Year	Credits
Chemistry 102, 103 (General)	8
Mathematics 110, 111 (Introduction) or Mathematics 115, 140 (Introductory and Elementary Analysis)	6-7
Zoology 101 (or Biology)	4
English 101 (Composition)	3
Elective (Social Sciences)	3
Elective (non-specific)	3
Physical Education as required	(2)
	29-30
Second Year	
Chemistry 201, 202, 203, 204 (Elementary Organic Chemistry)	8-10
Physics 121, 122 (Fundamentals)	8
History	6
English 201, 202 (Literature)	6
Economics 205	3
Elective (Fine Arts or Philosophy)	3
	34-36

Interested secondary school students are invited to write to the Dean of the School of Pharmacy in Baltimore for a catalog concerning the School and for literature about the opportunities in the pharmacy profession.

RECOMMENDED HIGH SCHOOL PREPARATION

The completion of an academic program containing the following courses is required for enrollment in the School of Pharmacy:

Subjects	Recommended Units	Required Units
English	4	4
College Preparatory Mathematics—including algebra (1), plane geometry (1) and additional units in advanced algebra, solid geometry, trigonometry, or advanced mathematics	4	2
Physical Sciences (Chemistry and Physics)	2	1
History and Social Sciences	2	1
Biological Sciences	1	0
Foreign Language—German or French	2	0
Unspecified academic subjects	1	8
Total	16	16

ADMISSION TO THE PROFESSIONAL PROGRAM AT BALTIMORE

Only the three year professional program is offered in Baltimore.

Students of all races, colors and creeds are equally admissible. It is the objective of the Unisity of Maryland Baltimore City campus to enroll students with diversified backgrounds in order to make the educational experience more meaningful for each student.

1. *From College Park Campus*

Students who have completed the prescribed preprofessional program with a scholastic average of not less than C (2.0), and who are in good standing will qualify for advancement to the pharmacy program in Baltimore, subject to the decision of the Admissions Committee of the School of Pharmacy.

In the semester preceding enrollment in the Baltimore division of the School of Pharmacy each student will be required to file a letter of intent with the Dean's Office of the School of Pharmacy at Baltimore.

2. *From Other Universities and Colleges*

Applicants for admission must present evidence of having completed successfully the required preprofessional program in an accredited college of arts and sciences based upon the completion of a four year high school course or the equivalent in entrance examinations. The college course must consist of a minimum of 60 semester hours of credit exclusive of physical education, health, military science, or similar courses.

All applicants for admission to the School of Pharmacy at Baltimore must have completed each of the courses in the prescribed preprofessional program with a grade of not less than C when the lowest passing grade is D or its equivalent and must be in good standing.

Provisional admission will be offered students who have successfully completed the science core (math, chemistry, zoology, or biology and physics) and all except *one* or *two* of the non-science courses of the preprofessional program on the understanding that these courses must be completed before graduation.

Professional Schools: Physical Therapy

The School of Medicine Physical Therapy

Physical therapy is a health profession concerned with the prevention, evaluation and treatment of disease processes and injuries amenable to the effects of certain physical agents (heat, cold, ultrasound, light, electricity, water, massage), and exercise when performed with due consideration for the emotional, social and economic facts related to the individual's health maintenance or recovery. Its purposes are affected through individual treatment or group instruction or by consultation and instruction of others concerned with patient care. Physical therapy is administered only when the patient is referred by a physician.

The educational program is accredited by the Council on Medical Education of the American Medical Association in collaboration with the American Physical Therapy Association.

For detailed information refer to the bulletin issued by the Department of Physical Therapy. This can be obtained by writing to the Department of Physical Therapy, School of Medicine, 520R West Lombard Street, Baltimore, Maryland 21201.

DEGREE AND REQUIREMENTS

The University of Maryland offers a four-year curriculum to men and women students leading to a Bachelor of Science degree after the completion of 139 semester hour credits (63 liberal arts and sciences, 72 professional, and four health and physical activities). The freshman and sophomore students are registered on the College Park, Baltimore County or Eastern Shore campuses and the junior and senior students on the Baltimore City campus. Qualified students from other accredited universities or colleges who have successfully completed appropriate courses may be admitted directly to the professional program at Baltimore beginning in the fall semester only.

Physical Therapy Curriculum

College Park Campus

Freshman Year	1st Sem.	2nd Sem.
ENGL 101—Composition	3	..
PHIL 100—Introduction to Philosophy (or course in Fine Arts)	..	3
SPCH 100—Public Speaking	..	3
CHEM 103, 104—General Chemistry	4	4
MATH 110, 111—Introduction to Mathematics	3	3
SOCY 100—Introduction to Sociology	3	..
PSYC 100—Introduction to Psychology	..	3
*BTPT 110, 111—Physical Therapy Orientation	1	1
Academic Hours	14	17
PHED—Physical Activities	1	1
HLTH 105—Science and Theory of Health	2	..
Total Hours	17	18
Sophomore Year		
ENGL 201, 202—World Literature	3	3
PHYS 121, 122—Fundamentals of Physics	4	4
ZOOL 101—General Zoology	4	..
ZOOL 102—The Animal Phyla	..	4
PSYC—Choice of 2 psychology courses	3	3
HIST—Choice of 2 history courses other than state	3	3
Total Hours	17	17

*Deleted for students admitted at junior level. Substitute hours required. Students transferring from a regionally accredited college for admission to the junior year must have completed 65 academic semester hour credits of courses comparable to those listed above with 2 S.H.C. of substitution for BTPT 110, 111 and a year of physical education and health (4 S.H.C.).

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